

Marine Review

SHIP OPERATION

SHIPBUILDING

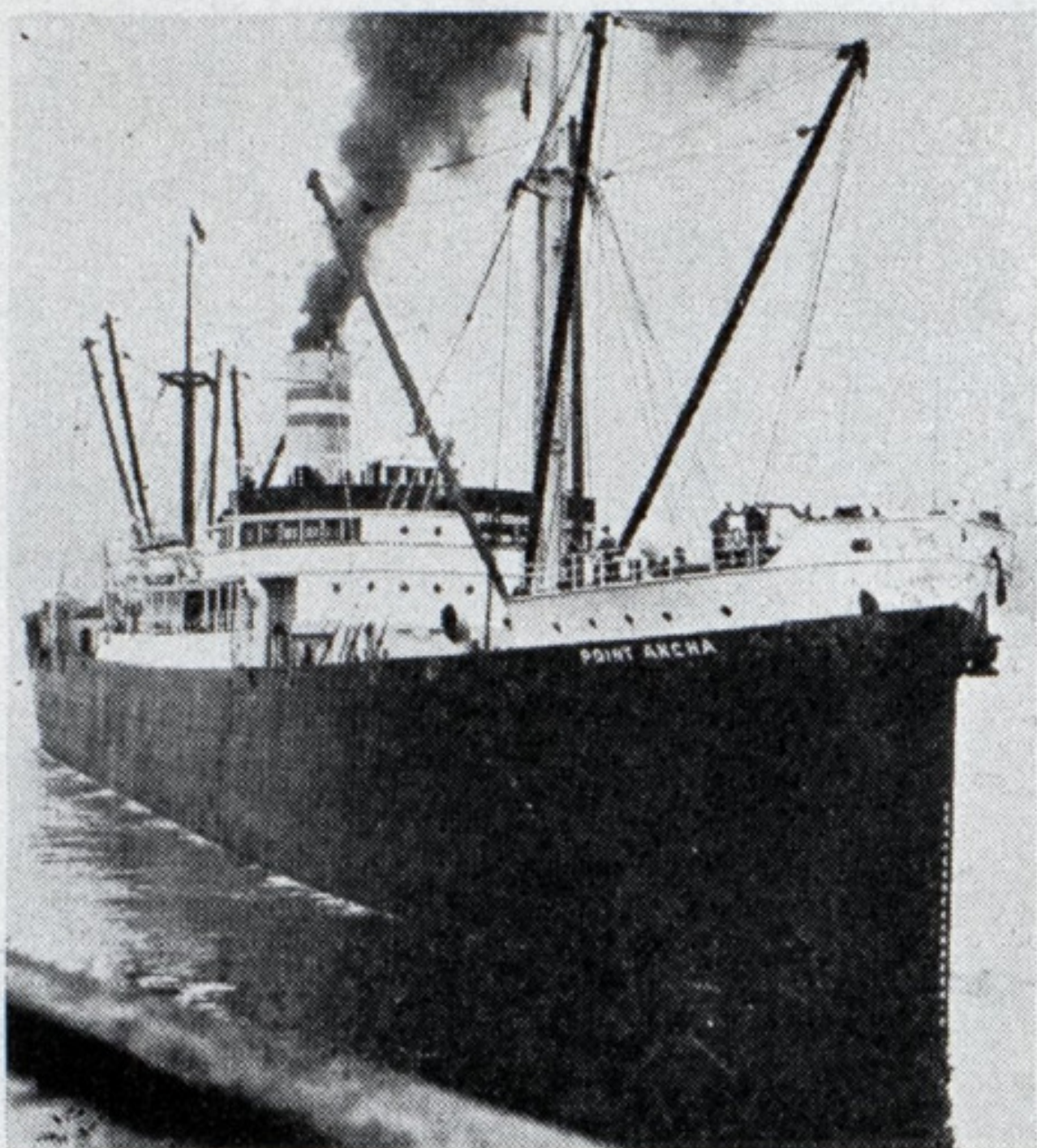
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CONTENTS

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	Page
Editorial	7
Coast Guard Shipbuilding Totals \$17,706,601	8
Shipping Subsidy Program Proposed	9
American Shipbuilding in 1933	12
By A. H. Jansson	
Distinctive Ships—Where to Find Them	13
Shipbuilding Record—Jan. 1, '33 to Jan. 1, '34	36-37
America's Maritime Sweepstakes	39
By R. J. Baker	
All-Welded Clam-Shell Dredge, Described.....	40
Maritime Law—Late Decisions	42
By Harry Bowne Skillman	
Ports—Marine Business Statistics Condensed	43
New Construction, Ordered and Contemplated	44
Bunker Prices—Domestic and Foreign	45
Stevedoring and Dock Management Progress	48
Paving the Way for Increased Profits	
By H. E. Stocker	
Cost of Stevedore Accidents at New York	50
By Frank C. Gregory	
Useful Hints on Cargo Handling	51
Fog Navigation Camera, on Liner Manhattan	52
Up and Down the Great Lakes	53
Personal Sketches of Marine Men	55
Daulton Mann, Vice President, Grace Line	
By Ben K. Price	



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American and British Shipping Policies

IF THE problem is approached with fairness, there is no reason for a conflict of interests between the United States and Great Britain in their respective shipping policies. The British have a long standing reputation for fair play. American shipping may well appeal to this traditional characteristic for justification.

Again and again it has been reiterated that the basis of past and future government support of American shipping is to offset real differentials in cost due to the higher prices an American shipowner must pay for the building and operation of his ships. All that is desired is to place the American shipowner on an equal competitive basis.

The existence of these differentials as between American and British costs in their respective shipping industries is not a matter of argument. They exist, and can be readily established. To place the American shipowner on a parity in competing for a share in carrying, not the commerce of the world at large, but only a part of that trade to which the United States is a party seems eminently fair and reasonable.

The importance of shipping to Great Britain is fully recognized and the United States has no desire or ambition to supplant Great Britain as the great carrier nation on the seas of the world. It is anxious to co-operate with Great Britain: "To restore prosperity to world trade on which all shipping depends and to encourage the abandonment of practices inimical to trade."

To carry out this purpose British shipowners, through the chamber of shipping, have proposed in part as follows:

"That the government should intensify its activity with all possible despatch in the negotiation of new or revised treaties and trade agreements on the following lines:

"Great Britain, in consultation with the

Dominions, should join with other nations in an effort to restore world trade. This group should include all the great creditor nations and should agree on the principles to be observed and concede most-favored-nation terms only to each other. Among these principles should be an obligation on each creditor nation to accept such payment in goods and services as will offset its creditor position and on all co-operating nations an obligation to stabilize prices and currencies and to restore the freedom of the seas for peaceful commerce. Bilateral agreements should first be negotiated but should be framed as far as possible to lead naturally to the formation of a group of countries which are prepared to trade with one another on the agreed principles.

"In order to enable other creditor nations to take payment from their debtors and thereby to restore the circle of world trade every effort should be made to convince the world's chief creditors that they cannot be paid either for debts or exports of goods and services unless they will accept payment in foreign goods and services."

There is little in this declaration of policy for American shipping to find fault with, provided it is not taken to mean that the United States as a creditor nation should accept payment for exports of goods and services in the services of British shipping to such an extent that it would not only mean the complete abandonment of our policy to build up an efficient merchant marine capable of carrying at least half of our own foreign trade, let alone give up even the comparatively small beginnings of an American merchant marine in foreign trade so far made possible by our shipping policy. This we cannot and will not agree to and the British sense of fair play will admit the justice of our position.

When we have finally convinced the British that we mean to stay on the seas and to build up an efficient, well-ordered merchant marine, adequate for our national needs, all thought of friction will disappear.

Surely these two great kindred nations can and will work out an accord in their shipping policies. Let us co-operate therefore, in a spirit of mutual understanding and friendliness.

U.S. Coast Guard Shipbuilding Totals \$17,706,601

LAST fall, with the aid of funds allocated by the public works administration, the United States coast guard initiated a large program of new ship construction. In its various phases this program has been reported in MARINE REVIEW from time to time since then. It would appear, however, that there might be some confusion with respect to the scope of this program, types of vessels, and where this work is to be carried out. For this reason a summary is given as follows:

First Group of Five Vessels

The first group, for which contracts were awarded Oct. 26, 1933, consisted of five cutters of the ESCANABA type. Three of these, named the ALGONQUIN, COMANCHE and MOHAWK were awarded to The Pusey & Jones Corp., Wilmington, Del., at a bid of \$499,800 each. Two, named the ONONDAGA and TAHOMA, were awarded to the Defoe Boat & Motor Works, Bay City, Mich., on a bid of \$563,800 each.

These five vessels are similar to the cutter ESCANABA, completed in November, 1932, by the Defoe Boat & Motor Works and described in the January, 1933 MARINE REVIEW. There is, however, one important difference, the three building at The Pusey & Jones Corp., are to be fitted with Westinghouse Electric & Mfg. Co. geared steam turbines and Foster Wheeler boilers; while the two building at the Defoe Boat & Motor Works are to have De Laval geared steam turbines and Babcock & Wilcox boilers.

Briefly, the general characteristics of these cutters are: displacement, 1000 tons; turbine geared drive of 1500 horsepower; single screw; length over all, 165 feet; length between perpendiculars, 150 feet; beam molded, 36 feet; depth molded, 21 feet; fuel, oil; service, coastwise or Great Lakes.

Second Group of Nine Vessels

The next group for which contracts were placed consisted of nine twin screw, diesel, patrol boats similar to the ARGO and GALATEA class completed early in 1933 by the John H. Mathis Co., Camden, N. J.

On Nov. 10, 1933 contract for three of these vessels, named the DIONE, ELECTRA, and PANDORA, was awarded to the Manitowoc Shipbuilding Corp., Manitowoc, Wis., at a bid of \$242,800 for each vessel. A contract for three of these vessels, named the ATALANTA, ARIADNE and CYANE, was awarded to the Lake Union Dry Dock & Machine Works on Nov. 15, 1933 at a bid of \$236,253 for each vessel. On Nov. 17, 1933 contract for three of this class,

named the TRITON, NIKE, and NEMESIS, was awarded to the Marietta Mfg. Co., Point Pleasant, W. Va. at a bid of \$248,210 for each vessel.

These patrol boats have the following characteristics: Hull of steel construction; length over all, 165 feet; beam molded, 25 feet, 3 inches; depth molded amidships, 13 feet, 2 inches; draft, maximum, 8 feet, 6 inches; displacement loaded, 334 tons; propelling machinery, twin screw Winton diesel engines, direct connected, of 1340 total shaft horsepower.

Third Group of Four Vessels

In the third group the four, single screw diesel electric, harbor cutters have been named CALUMET, HUDSON, NAVESINK and TUCKAHOE. Contract for these new vessels was awarded on Dec. 8, 1933 to the navy department on its estimate of \$235,953 as the cost for each boat. Construction of the CALUMET, NAVESINK and TUCKAHOE is now under way at the navy yard, Charleston, S. C.; while construction of the HUDSON is under way at the navy yard, Portsmouth, N. H.

These harbor cutters will be 110 feet, 6 inches in length over all; 24 feet in molded beam; 12 feet, 7 inches in molded depth amidships; maximum draft, about 10 feet, 6 inches; and displacement, fully loaded, about 290 tons. The machinery for each vessel will be two McIntosh & Seymour, 6 cylinders, 12½-inch bore by 13-inch stroke, diesel engines, each developing 530 brake horsepower, and each connected to an electric generator. The brake horsepower of the electric motor direct connected to the propeller will be 800. Each vessel will also have an auxiliary generator set driven by a 2-cylinder McIntosh & Seymour engine of 26 horsepower.

Fourth Group of Seven Vessels

The fourth and most important group includes seven 327-foot, 2000-ton ocean cruising cutters of the gunboat type. These vessels are to be named after secretaries of the treasury. Originally the public works administration authorized the construction of nine of these vessels, but estimates received proved too high to permit the construction of all nine and, therefore, the construction of seven has been authorized in order to keep within the total allotment of \$13,500,000.

On Jan. 26, 1934, the secretary of the treasury in a letter to the secretary of the navy accepted the estimates submitted by the navy department for the construction of these seven 327-

foot cruising cutters for the coast guard. The estimates submitted were as follows. New York navy yard for the construction of two vessels at an estimated cost of \$1,607,200 for each vessel; Philadelphia navy yard for the construction of five vessels at an estimated cost of \$1,636,000 for each vessel, and \$125,000 for co-ordination. In addition to the amount of \$11,520,000 transferred from the treasury department to the navy department to cover the construction of these vessels, a sum of \$294,000 has been set aside to cover a possible increase of 5 per cent in navy yard pay scale to take effect next July 1; and \$140,000 has also been set aside for possible contract changes, involving increased cost, which may be approved during the progress of the work. Therefore, a total amount of \$11,954,000 is available.

In allocating the work the navy department has ordered four of these vessels to be constructed at the navy yard, Philadelphia; two at the navy yard, New York; and one at the navy yard, Charleston, S. C.

Briefly the general characteristics of the ocean cutters are: Length overall, 327 feet; length between perpendiculars, 308 feet; beam molded, 42 feet; depth molded, amidships, 23 feet 6 inches; and displacement, 2000 tons. The propelling machinery, in twin screws, is to be double reduction geared steam turbines of a total estimated shaft horsepower of 7000, or somewhat over. Oil-fired watertube marine boilers will furnish steam. The speed is to be 20 knots and each vessel will have a cruising radius of 8000 miles.

These vessels are to have a specially constructed hangar for one airplane to be used in assisting in searching at sea for vessels in distress, derelicts, and in law enforcement duty. Each vessel will also carry two 6-inch guns, and two antiaircraft guns, with provision made for two more 6-inch guns.

Labor Is Widely Distributed

From the above, it will be noted that this large new shipbuilding program of the United States coast guard calls for a total expenditure of \$17,706,601, and that this work has been placed in five private shipyards and in four United States navy yards. Two of the private shipyards taking part in this building program are located on the Great Lakes, one on the Ohio river in West Virginia, one at Wilmington, Del., and one at Seattle, Wash. The four navy yards taking part in this building program are well spread out on the Atlantic seaboard from Portsmouth, N. H., to Charleston, S. C.

It would be difficult to picture any public works program more justified in the usefulness and value to the country of the units under construction, nor one where the employment of labor is so well distributed in an essential industry particularly hard hit by the depression.

Shipping Subsidy Program Proposed

Ask for Prompt Action in Congress

MARCH 13 may become a date of great significance in the development of the American merchant marine if the congress enacts shipping legislation to the extent and in the spirit proposed by Secretary Roper in the recommendations he transmitted on that day, with the authority of the President, to Congressman S. O. Bland, chairman of the committee on merchant marine, radio and fisheries. In his letter the secretary of commerce summarized as follows the recommendations made in a study on ship subsidy policies which had been prepared by Director Henry H. Heimann of the shipping board bureau under his supervision:

Summary of Recommendations

1. The present system of linking subsidies with the carrying of mail should be abandoned, and in its place specific subsidies granted for the maintenance of essential services should be given. Such subsidies should not be extended to lines in the protected trade.
2. Subsidy contracts should be based on the differentials in building and operating costs, should be sufficiently flexible to permit of equitable readjustments as changes in conditions occur, and should provide for necessary replacements.
3. Subsidies should be divided into four classifications:
 - a. Construction differential subsidy.
 - b. Operating differential subsidy.
 - c. Trade penetration subsidy.
 - d. Other conditions bearing on the issue, such as foreign subsidies, etc.
4. Money for subsidies should be appropriated from general treasury funds, and not as at present, provided indirectly through some other department of the government.
5. Subsidies should not be granted to more than one line competing in the same trade route without the business volume justifies it. We, of course would not wish to limit sound competition, but destructive competition should not be aided through subsidies.
6. The preceding proposals contemplate uniform cost information at all times available to the government, and regulatory power over subsidized lines or construction companies.
7. Administration of subsidies.

Subsidies to be recommended through a joint committee of experts, representing government departments having a direct interest in the development of the merchant marine. It is suggested that a representative of the department of commerce, state, treasury and navy departments would effectively coordinate the government's interest. The actual administration of each subsidy contract once entered into, however, should rest in the department of commerce.

In his letter the secretary also suggested that the new subsidy policy should be gradually introduced, replacing old subsidy contracts in fairness and equity, and if possible, through mutual agreement, to prevent demoralization of the industry. He further recommended that there should be competitive bids on all subsidies; and he expressed the hope that these needed changes may be effectuated through legislation at the present session of the congress. A copy of the secretary's letter was also sent to Senators Hugo L. Black, Duncan U. Fletcher, and Hubert D. Stephens.

The full report giving the details of the proposed ship subsidy policy as determined in the study made by Director Heimann of the shipping board bureau follows:

Ship Subsidy Policy

BECAUSE American shipbuilding and shipoperating costs are the highest in the world, due to superior standards of living in the United States, continued government aid is necessary in order to offset the competitive handicaps encountered by American ships operating in foreign trade. This aid, which should be placed on a more rational basis than the system now in effect, can be given either in the form of (1) preferential treatment by means of tariff or tax exemptions, or (2) by direct subsidies.

Preferential Treatment

THIS form of aid, used by Great Britain in achieving her maritime supremacy, and also by the United States in the early days of the republic, is predicated on the contention that in the control of the cargo factor lies the only hope of building up a strong merchant marine, and that direct subsidies do not necessarily mean cargoes.

"Under the preferential tariff plan, goods imported into the United

States in a ship of alien flag, from a country other than that under whose flag the ship operates, would pay a higher tariff than similar goods imported in an American ship. In the case of the United States, a great importing country, this form of aid would doubtless prove highly efficacious. The shipping act of 1920 carries a provision for preferential tariffs, coupled with a direction to the President to give notice of the abrogation of all reciprocal treaties in conflict therewith. While this is still the law, it has never been put into effect.

"Objections offered to the preferential tariff policy rest not so much on any doubt as to its efficacy as upon the fear that such a course would lead to reprisals by other countries.

"Another suggestion for aiding American ships by means of preferential treatment involves a graduated tonnage tax which would favor liners operating on fixed schedules, and would thus tend to minimize tramp competition.

"It is believed that any form of government aid which savors of discrimination, real or fancied, would (because of possible international repercussions) prove less desirable than a system of direct subsidies. At the moment such aid could scarcely be initiated nor expected to supplant subsidy payments.

Direct Subsidies

A STUDY of the results of the country's shipping policy during the post war period shows that its objectives have been only partially attained. Growing obsolescence of the fleet; inadequate provisions for replacements; the prevalence of wasteful practices throughout the industry; and, in recent years, an over-conservatism in the exercise of the government's regulatory function are but a few of the causes which have impaired the competitive position of American vessels in the foreign trade.

"The development of a more effective subsidy policy must, therefore, in fairness both to the country and the industry, be accompanied by a sound program of rationalization. Desirable amalgamations should be encouraged. A more effective use should be made of conference agreements, and of the other broad powers of regulation delegated by congress. Better coordination between shipping and other forms of transportation, such as rail and inland water carriers, should be brought about, as well as the coordination of

all governmental agencies dealing with the merchant marine. Excessive costs assessed against shipping enterprises by parent companies, subsidiaries, and affiliates should be abolished. Without rationalization along the lines indicated, no system of subsidies will be able to develop and maintain an adequate and permanent merchant fleet.

"Inasmuch as government aids to shipping have as their objective the establishment of an efficient and ultimately self-sustaining merchant marine, the essential trade routes to be served should be determined by analyzing the flow and volume of traffic, with due consideration to such other factors as military requirements, trade policies, industrial and agricultural needs, and the public interest generally. Differentials in costs of ship construction and ship operation should continue to form the basis for computing the amount of government aid required for each subsidized line. The differential in domestic and foreign construction costs is the major competitive disadvantage which the subsidy is designed to remove.

"Under the present mail contract system, the government has not participated adequately in the various construction programs, and has therefore not maintained even a semblance of control over the price of ships, notwithstanding that the construction differential has in each case been used as a factor in computing the amount of subsidy awarded.

"In view of the above the following recommendations are made:

(1) The present system of aid in the form of compensation for the carriage of ocean mails should be replaced by specific subsidies granted for the maintenance of essential services, but should not be extended to lines in protected trades.

(2) Subsidy contracts should be based on differentials in building and operating costs, should be sufficiently flexible to permit of equitable readjustment as changes in conditions occur, and should provide for necessary replacements.

(3) Subsidies should be differentiated in three broad classes: (a) A subsidy to cover the construction differential; (b) A subsidy to cover the operating differential; and (c) A trade penetration subsidy.

(4) Money for subsidies should be appropriated from general treasury funds and not, as at present, be provided indirectly through some other department of the government.

(5) Subsidies should not be granted to more than one line competing in the same trade.

Building Cost Differential Subsidy

THIS form of subsidy, paid to the shipowner either as a lump sum on completion of the ship, or in fixed installments (the terms to be determined at the time of the agreement) would bind the owner to oper-

ate the vessel in a designated service or services, under the American flag, and to comply with any other requirement stipulated by the government.

"Should the subsidy be paid in installments, the number and duration of the payments would be limited to the estimated useful life of the vessel. Provision could be made to disallow payments for inactivity in excess of a stipulated period, and for discontinuance of payments and possession of the vessel by the government for more serious violations of contractual obligations.

"In consideration of the benefits accruing to builders, they too should be parties to subsidy agreements, and together with owners should be required to maintain uniform cost accounts, to be rendered to the designated governmental authority in approved form, and to submit to examination of records when so requested by authorized representatives of the government.

"While the shipbuilding cost differential subsidy would as a rule apply only to future ship construction, consideration should be given to the advisability of compensating, through a modified form of shipbuilding subsidy, owners who are carrying high differential charges on account of vessels built during recent years.

Operating Cost Differential Subsidy

SUBSIDIES under this head would be granted to operators of American flag vessels in the foreign trade who contract with the government to maintain service of a stipulated character over a fixed period, and would be based on the operating differentials which handicap the American operator.

"Contracts involving operating cost differential subsidies should provide for payments by the government at stated intervals, and should also provide that the government or the operator may at any time, and should at stated periods, initiate a review and possible revision of the amount of subsidy originally agreed upon. Except in cases where extraordinary handicaps or peculiar advantages, due to traffic or other conditions, justify a modification of standard practice with regard to subsidy awards, the amount granted should cover only the actual differential in physical operating costs, and should not take cognizance of such items as equipment and supplies for passenger ships; repairs, materials, services, or supplies contracted for abroad; interest on indebtedness or invested capital; insurance, depreciation; damage claims or administrative charges. The operator should be compensated for the carriage of mail on a poundage basis, and should be required by the terms of the subsidy contract to set aside an adequate reserve for depreciation. As in the case of shipbuilding cost differential subsidies, the operator should also be

required to maintain, and to make available to the government, in approved form, records which reflect the financial results of operations.

"Operating cost differential subsidies might well take into account the disadvantageous conditions surrounding ship operators who compete for trade in new fields, as contrasted with operations conducted in well-established services. In determining the amount of subsidy for operators engaged in what may be described as "trade penetration," due allowance should be made for the peculiar conditions involving lesser cargoes and other handicaps, under which they compete with foreign lines long entrenched in the particular trade. In the present system of mail subventions the trade penetration factor may have been somewhat abused. To prevent a recurrence of this situation, consideration should be given to the establishment of a definite trade penetration subsidy, to be used only in special cases justified by the foreign trade policy of the government.

Method of Procedure

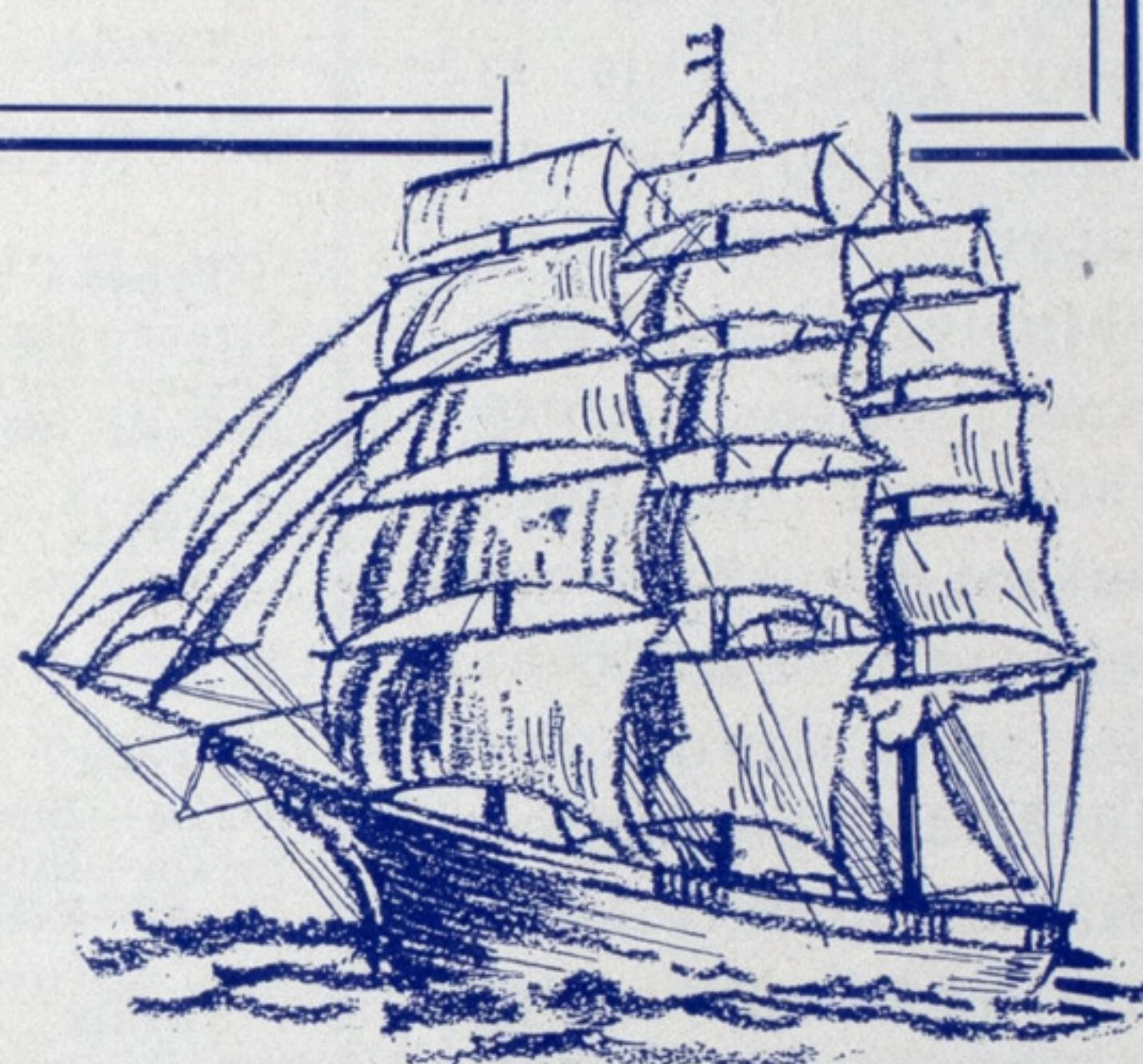
THE system of direct subsidies should be administered through a joint committee of experts representing government departments having a direct interest in the development of the merchant marine. A ship subsidy committee composed of representatives of the department of state, commerce department, treasury department and navy department would effectively coordinate the government's interest in matters of policy and in the final determination of individual contracts. Administration of each subsidy contract in all its details should, however, rest in the commerce department.

"Introduction of any new subsidy program should be gradual to prevent demoralization of the industry and for competitive reasons. The following procedure is suggested:

- (a) Determine the type of subsidy and method of administration.
 - (b) Determine the services to be subsidized.
 - (c) Provide shipping lines now subsidized with opportunity to accept the new subsidy plan where it is found that these lines are entitled to such treatment. Cancel subsidy contracts of shipping lines found not to be entitled to aid, giving due consideration to the interests of the company involved.
 - (d) Present operators of subsidized lines who are unwilling to continue under a new subsidy shall have existing mail contracts cancelled. Due consideration should be given to their interests and the interests of the government before inviting bids from or negotiating with other operators.
- (Continued on Page 56)



Marine Progress



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Marine Review

April 1934



SHIP CONSTRUCTION

In American Shipyards During 1933

SHIP BUILDING the world over suffered a sharp decline in the year 1933. In merchant vessels of 100 tons each and upward, less than half a million gross tons were launched in the world during that year or nearly a quarter of a million tons less than in the year 1932. This is less, according to Lloyd's Register of Shipping, than at any time since before 1900 and the total output for 1933 was less than 15 per cent of the figure for 1913. In the United States the shrinkage in merchant shipbuilding during 1933 was still greater.

This condition is vividly reflected in the accompanying review and analysis of steel, powered, merchant type of vessels of 100 gross tons and up or 100 feet in length and over which were under construction in any stage, or contracted for in American shipyards during the calendar year 1933. This is the eleventh consecutive year such a review and analysis has been published in MARINE REVIEW. Government vessels of merchant type are included, such as cutters, tenders, etc.

A complete record of vessels in this category for the year 1933 giving shipyard, owner, type, machinery and principal dimensions will be found on pages 36 and 37.

Motive Power Compared--Two Years

Types	Number		Per Cent	
	1933	1932	1933	1932
Steam reciprocating coal burner	1	2	1.5	2.7
Steam reciprocating oil burner	9	14	13.4	18.7
Steam turbine oil burner	13	16	19.4	21.3
Diesel engine direct drive	34	35	50.8	46.6
Diesel engine electric drive	9	3	13.4	4.0
Turbine electric oil burner	1	5	1.5	6.7
Totals	67	75	100.0	100.0

Recapitulating for Primary Power

Types	Number		Per Cent	
	1933	1932	1933	1932
Steam—As primary power	24	37	35.8	49.3
Diesel—As primary power	43	38	64.2	50.7
Totals	67	75	100.0	100.0

Recapitulating for Power at Propeller

Types	Number		Per Cent	
	1933	1932	1933	1932
Steam—Direct and gears	23	32	34.3	42.6
Diesel—Direct drive	34	35	50.8	46.7
Electric—Steam and diesel	10	8	14.9	10.7
Totals	67	75	100.0	100.0

Recapitulating for Fuel

Types	Number		Per Cent	
	1933	1932	1933	1932
Steam—Burning coal	1	2	1.5	2.7
Steam—Burning fuel oil	23	35	34.3	46.6
Diesel—Diesel oil as fuel	43	38	64.2	50.7
Totals	67	75	100.0	100.0

Though this record has been compiled with every effort for accuracy and completeness there are, no doubt, a few additional vessels which should have been included had it been possible to identify them. But the fact remains that the record of vessels published truly represents the extent of American shipbuilding in the category defined.

For the year 1933 the number of vessels listed is 67 as compared, on the same basis, with 75 for 1932; 94 for 1931; 130 for 1930; 145 for 1929; 92 for 1928; 105 for 1927; 121 for 1926; 107 for 1925; and 102 for 1924.

The showing for 1933 would have been still less favorable had it not been for the considerable program of new shipbuilding initiated by the United States coast guard before the end of the year, which included a total of 18 vessels. A number of vessels for the bureau of lighthouses also helps to swell the total.

As in former years in this shipbuilding review in order to give specific information on the types of vessels under construction, 16 out of

the list of those that were completed during 1933 have been illustrated and described in their essential characteristics, in the following pages.

Counting sis-

Analysis of Power and Gross Tonnage of Vessels Listed on Pages 36-37

Type of Power	Number of Vessels	Total Gross Tons	Total Horsepower	Average Gross Tons	Average Horsepower
Turbine Electric	1	7,000	10,500	7,000	10,500
Turbine Gears	13	98,310	97,800	7,562	7,523
Reciprocating	10	9,270	12,800	927	1,280
Diesel Electric	9	4,573	5,690	508	632
Diesel Direct	34	16,463	29,990	484	882
Totals	67	135,616	156,780	2,024	2,340

Note: Displacement has been used for government vessels, as approximately equivalent to gross tonnage.

terships, the 16 selected vessels represent 27 out of the 67 listed. In other words, principal dimensions, characteristics, machinery, and equipment particulars are thus given for 27 vessels that were completed in American shipyards during 1933. The information given because of its uniformity makes it possible to readily compare vessels of different types and services or to make comparisons between vessels of similar types described in the same manner in the previous shipbuilding issues of MARINE

REVIEW. Vessels of many different types are included. In the eleven years that a similar presentation has been made some 254, merchant type, steel hull, powered vessels have been illustrated and described.

In the accompanying tables an analysis has been made of the 67 vessels listed for type, propelling machinery, size and fuel used. This analysis shows, for instance, that the diesel engine was used as primary power in 43 and that steam was used as primary power in 24. In other words, considering for the moment only the number of units, for primary power, steam was used in 35.8 per cent and diesel in 64.2 per cent. For 1932 these figures were respectively 49.3 per cent and 50.7 per cent and in 1931 61.7 per cent and 38.3 per cent. The

reason for this apparent rapid increase in the use of diesel as primary power is because of the increasing proportions of smaller vessels in each succeeding year. If propelling power is considered on the basis of tonnage the condi-

tion is entirely reversed. No less than 84.5 per cent of the tonnage represented by the 67 vessels were fitted with steam propelling power, while only 15.5 per cent of the tonnage was fitted with diesel primary propelling power.

Again it will be noticed that the total steam

horsepower in 24 units is 121,100 and that the total horsepower in the 43 vessels fitted with diesel engines is 35,680, or 77.2 per cent for steam and 22.8 per cent for diesel.

It is clear from the present analysis that the tendency to use diesel power in place of steam in the lesser powers continues. In not a single instance in the 67 vessels, however, was the diesel engine used in the larger powers. About the largest single diesel engine used for power in any vessel listed was 1200 brake horsepower. Coal as fuel has practically disappeared. Only one vessel has been so equipped. The number of steam reciprocating units is steadily declining being 14.9 per cent for 1933 compared with 21.4 per cent for 1932; 23.4 per cent for 1931; and 27.7 per cent for 1930.

ANALYSIS OF AMERICAN MERCHANT SHIPBUILDING—1933							
COMPILED BY MARINE REVIEW							
TYPES OF VESSELS	NUMBER	TURBINE OIL	TUR. ELEC. OIL	DIESEL OIL	DIES. ELEC. OIL	RECIP. OIL	RECIP. COAL
PASSENGER—OCEAN	5	4	1				
PASSENGER—COAST	1			1			
FREIGHTER—OCEAN	2	2					
FREIGHTER—COAST	2			2			
FREIGHTER—CANALS	1				1		
TANKER—OCEAN	2	2					
TANKER—COAST	4			4			
TANKER—CANALS, BAYS	3			2	1		
FERRY—HARBOR, BAYS	2			1		1	
TOWBOAT—HARBORS	4			2	1		1
TOWBOAT—RIVERS	5			4		1	
DREDGE—HARBORS	1			1			
DREDGE—BAYS, RIVERS	4			1		3	
SPECIAL—COAST	20	5		11		4	
SPECIAL—LAKES, BAYS	11			5	6		
TOTALS	67	13	1	34	9	9	1

Distinctive Ships—Where To Find Them

Passenger Ships

Name and Service	Page
Peten, Ocean, Passenger, Freight	19
Santa Elena, Ocean, Passenger, Freight	14
Washington, Ocean, Passenger, Freight	15

Freighters

Dolomite No. 1, Lakes, Canals, Coastwise.....	22
---	----

Towboats

Bob Gresham, Rivers	26
Huntington, Harbor	30
Tom Sawyer, Western Rivers	18
Turecamo Girls, Harbors	24
Y. T. 119, (Navy), Harbors	31

Special Types

Name and Service	Page
Arbutus, Lighthouse Tender	32
Dahlia, Lighthouse Tender	34
Lilac, Lighthouse Tender	28
Wistaria, Lighthouse Tender	27

Dredges

Burgess, Western Rivers	23
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Ferries

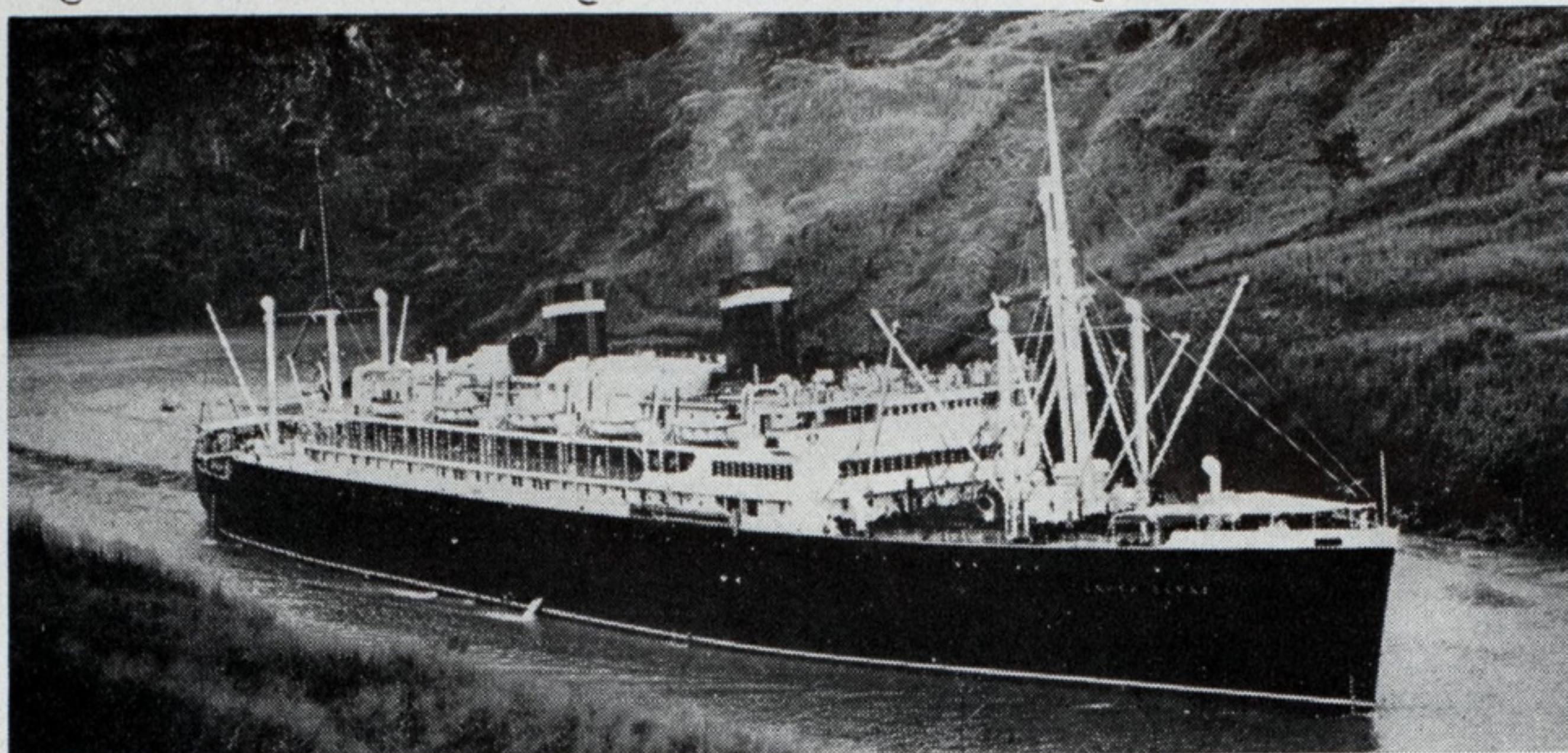
Delmarva, Passenger, Automobiles, Bays	20
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Tankers

Timothy B. O'Connell, Harbors, Bays	35
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See Pages 36-37 for Complete Shipyard Record

SANTA ELENA—Passenger—Ocean—Twin Screw—Turbine



DESCRIPTION

This vessel and three sister ships, have established a high standard of service and have become very popular with travelers. They are operated by the Grace Line between New York and the west coast of Central America, Mexico and the United States, and to British Columbia.

Name—Santa Elena
Owner—Grace Line
Builder—Federal Shipbuilding & D. D. Co
Naval Architect—Gibbs & Cox Inc.
Launched—Feb. 6, '33; Comp. Mar. 22, '33
Sister Ships—Santa Rosa, Santa Paula, and Santa Lucia. Launched respectively, March 24, 1932; June 11, 1932; and Oct. 3, 1932. Completed respectively, Oct. 27, 1932; Dec. 23, 1932; and Feb. 6, 1933.

Classification—American Bureau of Shipping

HULL PARTICULARS

Length over all, 508 feet; length between perpendiculars, 484 feet; breadth molded, 72 feet; depth molded, 39 feet; draft loaded, 26 feet, 2½ inches; displacement loaded, 16,500 tons; gross tonnage, 11,200; net tonnage, 5813; passenger capacity, first class, 225; third class, 65; cargo capacity, cubic feet, 290,000; speed in service, 18½ knots.

MACHINERY PARTICULARS

Main Engines—Two, double reduction geared, cross compound turbines, designed and built by the General Electric Co. Total horsepower normal, 12,000 at 95 revolutions per minute.

Boilers—Four, Foster Wheeler, watertube marine boilers, with a total heating surface of 19,640 square feet; total superheating surface of 7820 square feet; and total economizer heating surface, 12,096 square feet; maximum designed working pressure, 450 pounds; pressure at superheater outlet, 400 pounds; total temperature of steam, 750 degrees Fahr.; fuel, oil. Superheaters, economizers, and water walls, supplied by the Foster Wheeler Corp. Oil burning equipment, five oil burners in each boiler, supplied by Todd Combustion Engineering Inc., a subsidiary of Todd Shipyards Corp.; smoke indicators were supplied by Wager Furnace Bridgwall Co., and fire brick and walls by Dietrich Arch Co. The same boilers and equipment were also installed on the Santa Paula. The other two vessels, the Santa Rosa and Santa Lucia, are fitted with Babcock & Wilcox boilers, superheaters, desuperheaters, oil burning equipment, economizers and furnace brick; also Diamond Power Specialty Corp. soot blowers.

Generating Sets—Five, General Electric; four of 500 kilowatts each, two of which are driven by main propulsion turbines and two independent; one of 200 kilowatts. One emergency generator, 20 k.w., driven by 3-cylinder Winton diesel engine.

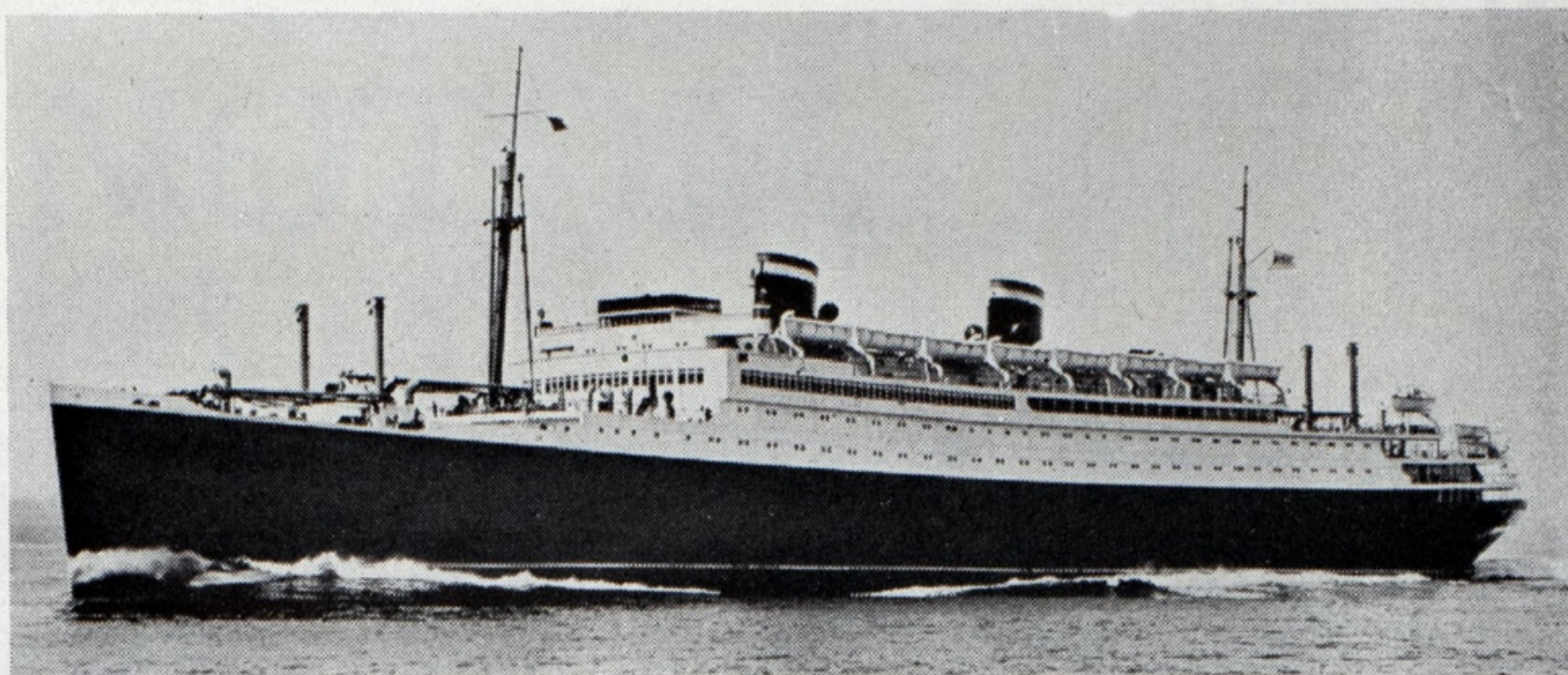
AUXILIARY EQUIPMENT

Pumps—Worthington; Ingersoll-Rand; De Laval; Northern; Nash; Quimzy; Warren
Windlass, Winches—Hyde Windlass Co.
Steering Gear—Hyde Windlass; Waterbury
Telegraph, Telephone—Chas. Cory Corp.
Propellers—Cramp Brass & Iron Foundries
Refrigeration—Carrier-Brunswick
Condensers, Compressors—Ingersoll-Rand
Electric Motors—General Electric Co.
Thrust Bearings—Kingsbury Machine Works
Blower Equipment—American Blower Corp.
Watertight Doors—American Locomotive Co.
Air Ejectors—Ingersoll-Rand Co.
Evaporators, Distillers—Davis Eng. Corp. also, feed water, and fuel oil heaters
Indicator, Salinity—Alexander McNab
Anchor Chain—National Malleable & S. C.
Anchor—Baldt Anchor, Chain & Forge Co.
Valves; Plumbing Fixtures—Crane Co.
Ventilating Fans—Ilg. Electric Vent Co.
Elevators—Otis Elevator Co.
Oil Purifiers—The De Laval Separator Co.
Lubricating Oil Coolers—Alco Products
Galley Equip.—Edison G. E. Appliance Co.
Fire Extinguishers—Walter Kidde & Co.
Recorders, CO₂—The Permutit Co.
Radio Equipment—Radmarine Corp.
Telephone System—Graybar Electric Co.
Gyro Compass, Pilot—Sperry Gyroscope Co.
Rudder Indicator—Sperry Gyroscope Co.
Searchlight—Sperry Gyroscope Co.
Engines (Lifeboats)—Standard Motor Const.
Lifeboats, Davits—Welin Davit & Boat Corp.
Fathometer—Submarine Signal Co.
Revolution Counters—Cummings Mach.
Deck Covering—Selby, Battersby & Co.
Windows—Kearfott Engineering Co. Inc.
Sidelights—American Locomotive Co.
Rubber Flooring—Goodyear Tire & Rubber
Finishes, Paint—E. I. du Pont de Nemours
Blocks—W. H. McMillan's Sons
Clocks—Chelsea Clock Co.

WASHINGTON—Passenger—Ocean—Twin Screw—Turbine

DESCRIPTION

This vessel and her sistership the MANHATTAN, are the two largest merchant ships built in American shipyards. Since entering transatlantic service, up to Feb. 19, 1933, and not including the then current voyage of the WASHINGTON, these two vessels carried 41,293 passengers.



Name—WASHINGTON

Owner—United States Lines

Builder—New York Shipbuilding Co.

Naval Architect—E. H. Rigg

Launched—Aug. 20, '32; Comp. May 2, '33

Sister Ship—MANHATTAN; Launched, Dec. 5, 1931; completed, July 27, 1932

Classification—American Bureau of Shipping

HULL PARTICULARS

Length over all, 705 feet, 3 inches; length between perpendiculars, 666 feet; breadth molded, 86 feet; depth molded, to C deck, 47 feet; draft, 30 feet, 8 7/8 inches; displacement loaded, 33,557 tons; gross tonnage, 24,289; net tonnage, 13,924; passenger capacity, cabin, 564; tourist, 366; third, 141; cargo capacity, in tons, 4130; cargo capacity, cubic feet, 374,240 general and 38,300 refrigerated; bunker fuel oil capacity in tons, 4775; speed, 20 knots.

MACHINERY PARTICULARS

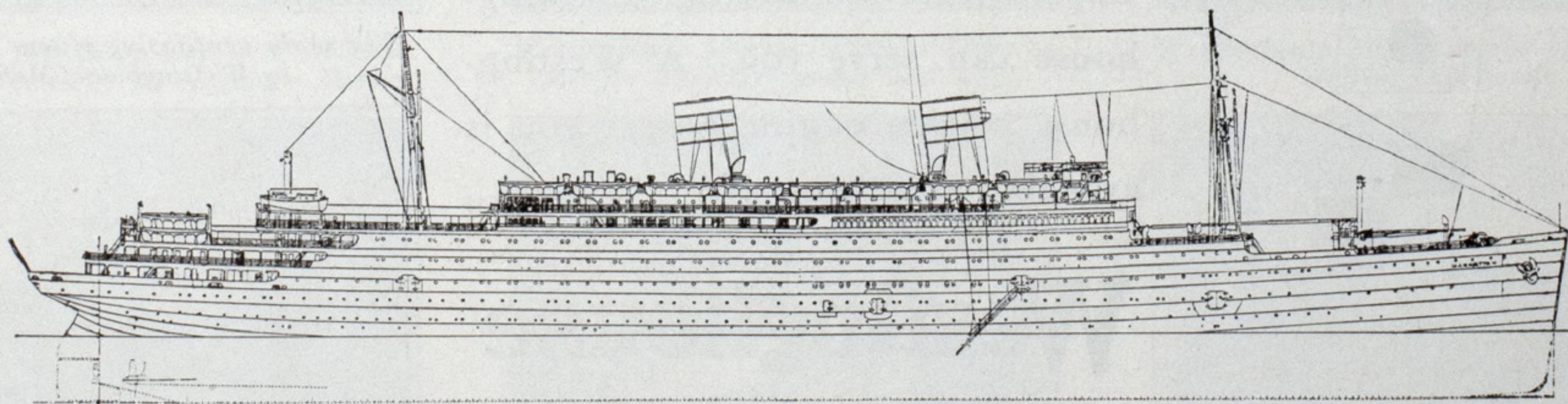
Main Engines—Two sets, triple series, single reduction geared turbines, built by New York Shipbuilding Co. Each set developing 15,000 horsepower, is connected to a propeller shaft through single reduction gears supplied by the Falk Corp. Propeller speed 125 r.p.m.

Boilers—Six, Babcock & Wilcox express type watertube marine boilers with total heating surface of 63,000 sq. ft. and superheating surface of 15,042 sq. ft.; 49,242 sq. ft. air heating surface; working pressure 409 pounds; superheat 211 degrees Fahr.; total temperature, 670 degrees Fahr.; fuel, oil. Superheaters, air heaters, oil burning equipment, furnace brick etc. by The Babcock & Wilcox Co. Soot blowers, Diamond.

Generating Sets—Four, Westinghouse, turbine, each 500 k.w., 240 volt. d.c. One emergency set, 75 k.w. Superior diesel, Storage batteries (120 cells) Electric Storage Battery Co.

AUXILIARY EQUIPMENT

Electrical Motors—Westinghouse Electric
Pumps—Worthington; De Laval; Warren; Northern; and Quimby
Windlass—Allan Cunningham
Winches—Lidgerwood Mfg. Co.
Steering Gears; Gyssys—American Eng. Co.
Refrigeration; Air Cond.—Carrier-Brunswick
Oil Heaters—Davis Engineering Co.
Thrust Bearings—Kingsbury Machine Works
Propellers—Cramp Brass & Iron Foundries
Windows—Kearfott; Amer. Locomotive Co.
Chain Cable—National Mal. Steel Cast. Co.
Anchor—Baldt Anchor Chain & Forge Corp.
Plumbing; Valves—Crane Co.; Lukenheimer
Enameled Ware—Standard Sanitary Mfg. Co.
Fan Motors—Diehl Mfg. Co.
Galleys (electric)—Edison G. E. Appliance
Radio Equip.—Mackay Radio Telegraph Co.
Evaporators, Distillers—Griscom-Russell Co.
Recorders (CO₂)—The Permutit Co.
Oil Purifiers—The De Laval Separator Co.
Gyro Compass, Pilot—Sperry Gyroscope Co.
Engines (lifeboats)—Standard Motor Constr.
Fathometer—Submarine Signal Co.
Lifeboats, Davits—Welin Davit & Boat Corp.
Fire Detecting—Henschel; Walter Kidde
Telephones—Chas. J. Henschel & Co. Inc.
Rubber Flooring—Goodyear Tire & Rubber
Deck Covering—Asbestolith Mfg. Co.
Paneling (250,000 sq. ft.)—Haskelite Mfg.
Condenser Tubes, etc.—The Amer. Brass Co.
Finishes—E. I. du Pont de Nemours & Co.
Locks—Schlage Lock Co.
Ice Cream Cabinets—Frigidaire Corp.
Fans, Blowers, Turbines—B. F. Sturtevant Co.
W. T. Doors (electric)—Cutler-Hammer Co.
Rigging Blocks—W. H. McMillan's Sons



TOM SAWYER—Towboat—Rivers—Twin Screw—Diesel



DESCRIPTION

The TOM SAWYER and sister vessel FRANKLIN D. ROOSEVELT are twin screw, tunnel type, direct diesel drive towboats, built for the Inland Waterways Corp., for service on the upper Mississippi river and its tributaries. See MARINE REVIEW for July, 1933.

Name—TOM SAWYER
Owner—Federal Barge Line
Builder—Midland Barge Co., Midland, Pa.
Naval Architect—Owner's Engineering Staff
Launched—Feb 27, '33; Comp. May 15, '33
Sister Ship—FRANKLIN D. ROOSEVELT. Completed July 13, 1933 and entered service
Classification—American Bureau of Shipping

HULL PARTICULARS

Length over all, 160 feet, 9½ inches; length between perpendiculars, 160 feet; breadth molded, 40 feet; depth molded, 8 feet; draft, 4 feet, 5½ inches; displacement loaded, 646 tons; gross tonnage, 603.68; net tonnage, 495; bunker diesel fuel capacity in tons, 100; speed, with tow, 6 miles per hour; without tow, 8 miles per hour.

MACHINERY PARTICULARS

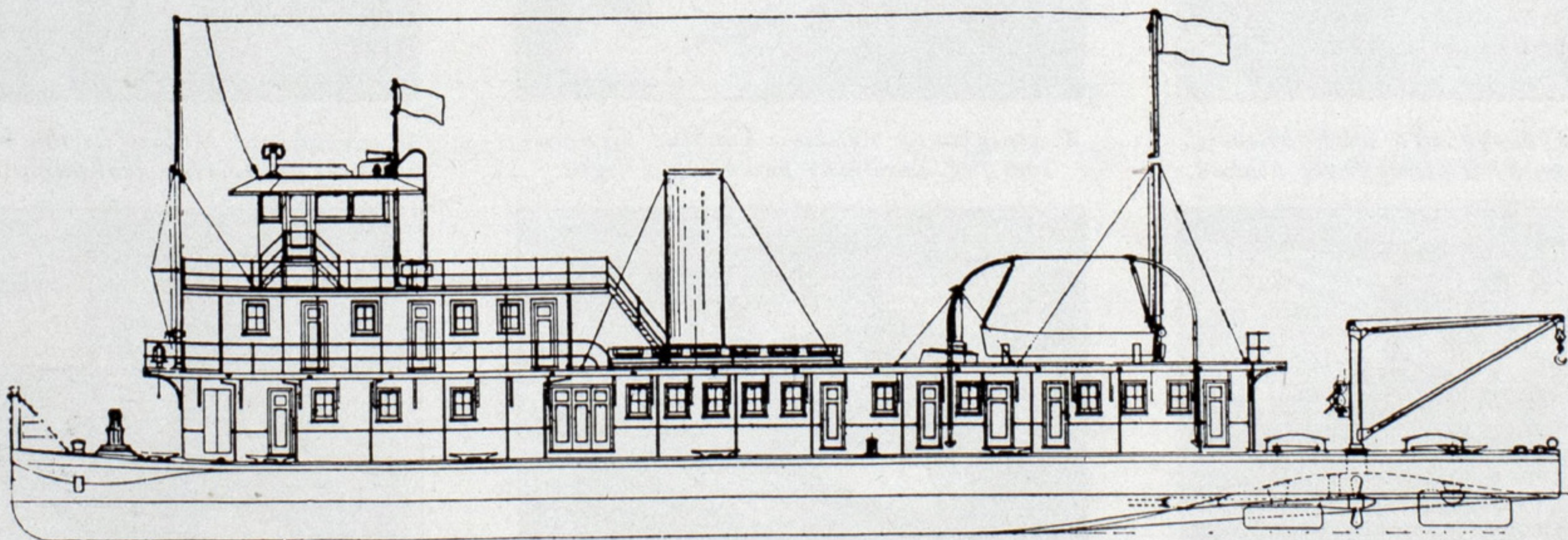
Main Engines—Two, 4-cycle, 8-cylinder, single acting, mechanical injection, direct reversing, marine diesel engines, of 12½-inch bore and 22 inches stroke; built by McIntosh & Seymour Corp. Each engine develops 590 brake horsepower at 300 revolutions per minute, and 675 brake horsepower at 330 revolutions per minute, making a total of 1350 b.h.p., at overload rating. Each engine is direct connected to a propeller working in a partial tunnel.

Auxiliary Generators—Three, General Electric, direct current; two of these generators

each of 30 k.w., 120 volts, are driven by vee belts from the main engines; one of these generators, of 30 k.w., is driven by a 45 brake horsepower McIntosh & Seymour diesel engine. All three generators, or either one, will operate on the main bus while a 56-cell storage battery of Electric Storage Battery Co. make is "floating" on the line.

AUXILIARY EQUIPMENT

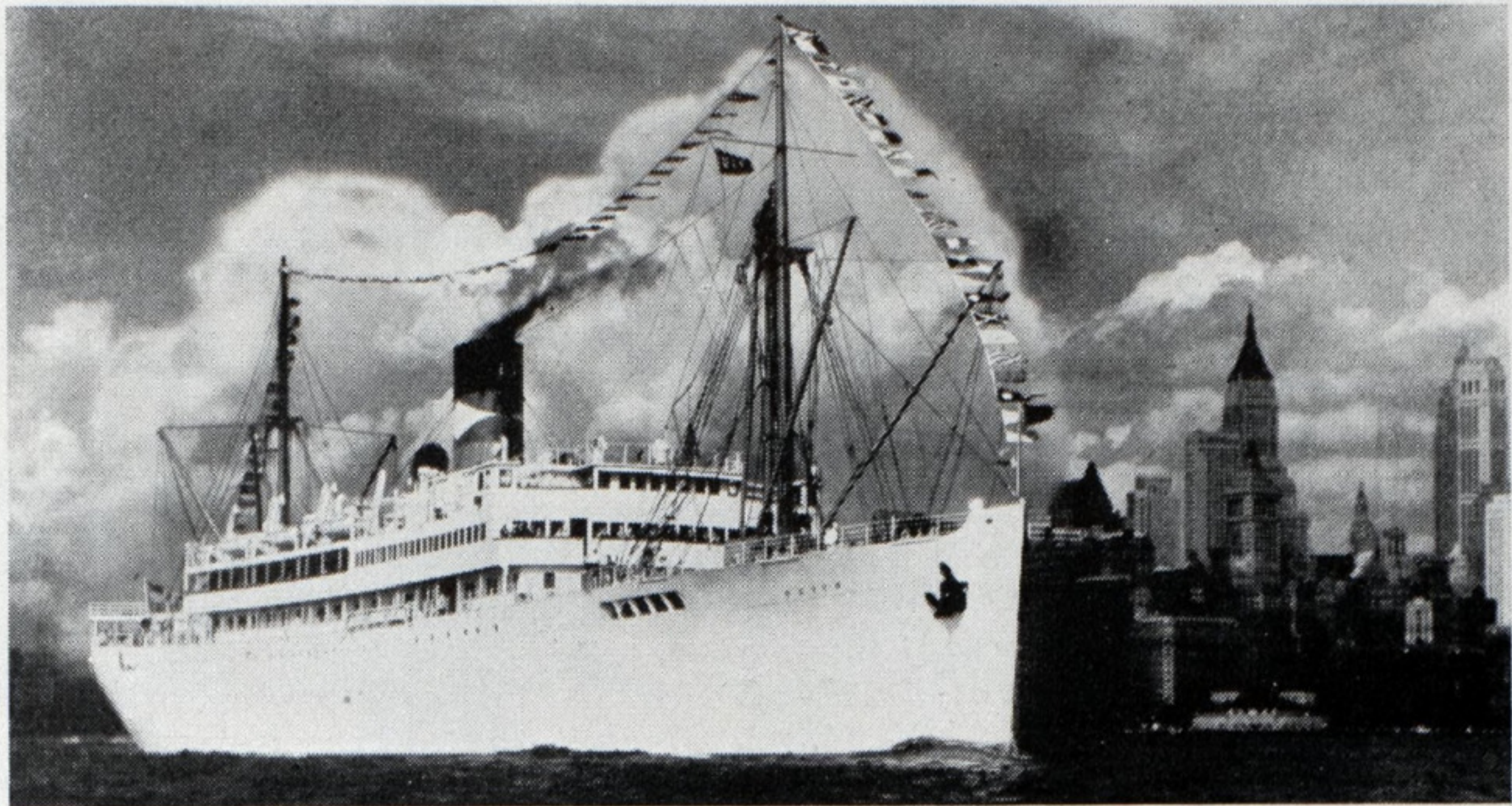
Pumps—Goulds; Allis Chalmers; Nash; Worthington; Perfection, and Viking
Capstans, Electric—American Engineering
Gypsy, Electric—American Engineering Co.
Electric Motors—G.E., Diehl; Westinghouse
Steering Gears—Hyde; Waterbury; Diehl
Thrust Bearings—Kingsbury Machine Works
Cooling Units—Alco Products Co.
Refrigeration—Baker Ice Machine Co.
Heating Boiler—Kewanee; Ray Burner
Winch, Electric—Lidgerwood Mfg. Co.
Fire Extinguishers—Walter Kidde & Co.
Oil Purifiers—The Sharples Specialty Co.
Deck Covering—Asbestolith Mfg. Co.
Galley Equipment—Elisha Webb & Son Co.
Marine Hardware—The Dayton Mfg. Co.
Air Compressors—Two, Sullivan Mach. Co.
Searchlights—Two, Carlisle & Finch Co.
Radio Transmitting Set—Westinghouse
Switchboard—General Electric Co.



PETEN—Passenger—Ocean—Twin Screw—Turbine Electric

DESCRIPTION

The PETEN, completed in February, 1933, is the latest of the six fast, twin screw, turbine electric, passenger and cargo vessels, to be added to the fleet of the United Fruit Co. Except in minor details of equipment, she is similar to the others, which, as a class, were fully described in MARINE REVIEW for January and July, 1932.



Name—PETEN

Owner—United Mail Steamship Co.

Builder—Newport News S. B. & D. D. Co.

Naval Architect—Newport News S. B. Co.

Launched—Aug. 15, '31; Comp. Feb 24, '33

Sister Ships—TALAMANCA, CHIRIQUI (by Newport News S. D. and D. D. Co.); ANTGUA, QUIRIGUA, VERAGUA (by Bethlehem S. B. Corp.)

Classification—American Bureau of Shipping

HULL PARTICULARS

Length overall, 447 feet, 10 inches; length between perpendiculars, 415 feet; breadth molded, 60 feet; depth molded to upper deck, 34 feet, 9 inches; draft, 24 feet; displacement loaded, 10,928 tons; gross tonnage, 6982; net tonnage, 3178; passenger capacity, first class only, 113; cargo capacity in cubic feet, 245,800, to inside of insulation, 198,400 cubic feet bale; bunker fuel oil capacity in tons, 1405; speed in service, 17½ knots.

MACHINERY PARTICULARS

Main Engines—Two, General Electric turbine generating units and two electric motors direct connected to propellers. Total horsepower, 10,500 at 125 revolutions per minute. The generators are alternating current and are each of 4200 kilowatts capacity. Fuel consumption, .733 pound of oil per shaft horsepower per hour.

Boilers—Four, Babcock & Wilcox watertube marine boilers with a total heating surface of 22,492 square feet and a total superheating surface of 2248 square feet; working pressure, 350 pounds; superheat, 230 degrees Fahr.; fuel, oil.

Auxiliary Generators—Three, geared turbine, direct current, General Electric, each 500 k.w.

AUXILIARY EQUIPMENT

Pumps—Warren Steam Pump (principally)

Windlass—Winches Hyde Windlass Co.

Boat Winches—Lidgerwood Mfg. Co.

Steering Engine, Gypsy—American Eng. Co.

Propellers—Cramp Brass & Iron Foundries

Refrigeration—York; General Electric

Oil Burning Equip.—Todd Shipyards Corp.

Feed Water Heaters—Alco Products Inc.

Blowers—American Blower Corp.

Anchor and Chain—Baldt A. C. & Forge Co.

Galleys—Edison G. E. Appliance Co.

Plumbing Fixtures—Crane Co.

Valves—The Lukenheimer Co.

Thrust Bearings—Kingsbury Machine Works

Fire Extinguishers—Walter Kidde & Co.

Emergency Lighting—Weir Kilby Corp.

Storage Batteries—Edison Stor. Bat. Co.

Lubricating Oil Coolers—Griscom-Russell

CO₂ Recorders—The Permutit Co.

Radio Telegraph—Radiomarine Corp.

Gyro Compass, Pilot—Sperry Gyroscope Co.

Fathometer—Submarine Signal Co.

Evaporators, Distillers—Davis Engineering

Deck Covering—Selby, Battersby & Co.

Turbines (pump drive)—Terry Steam Tur. Co.

Oil Purifiers—De Laval Separator Co.

Revolutions Counters—Cummings Mach. Wks.

Electric Motors—General Electric Co.

Fire Detecting—Walter Kidde & Co.

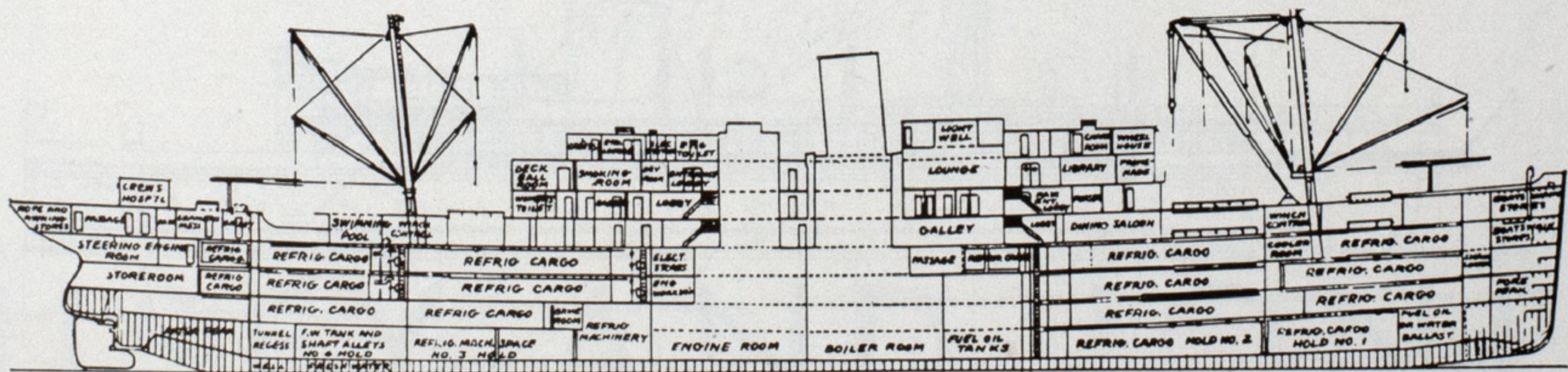
Fire Alarm System—Chas. J. Henschel

Telegraphs—Chas. J. Henschel & Co.

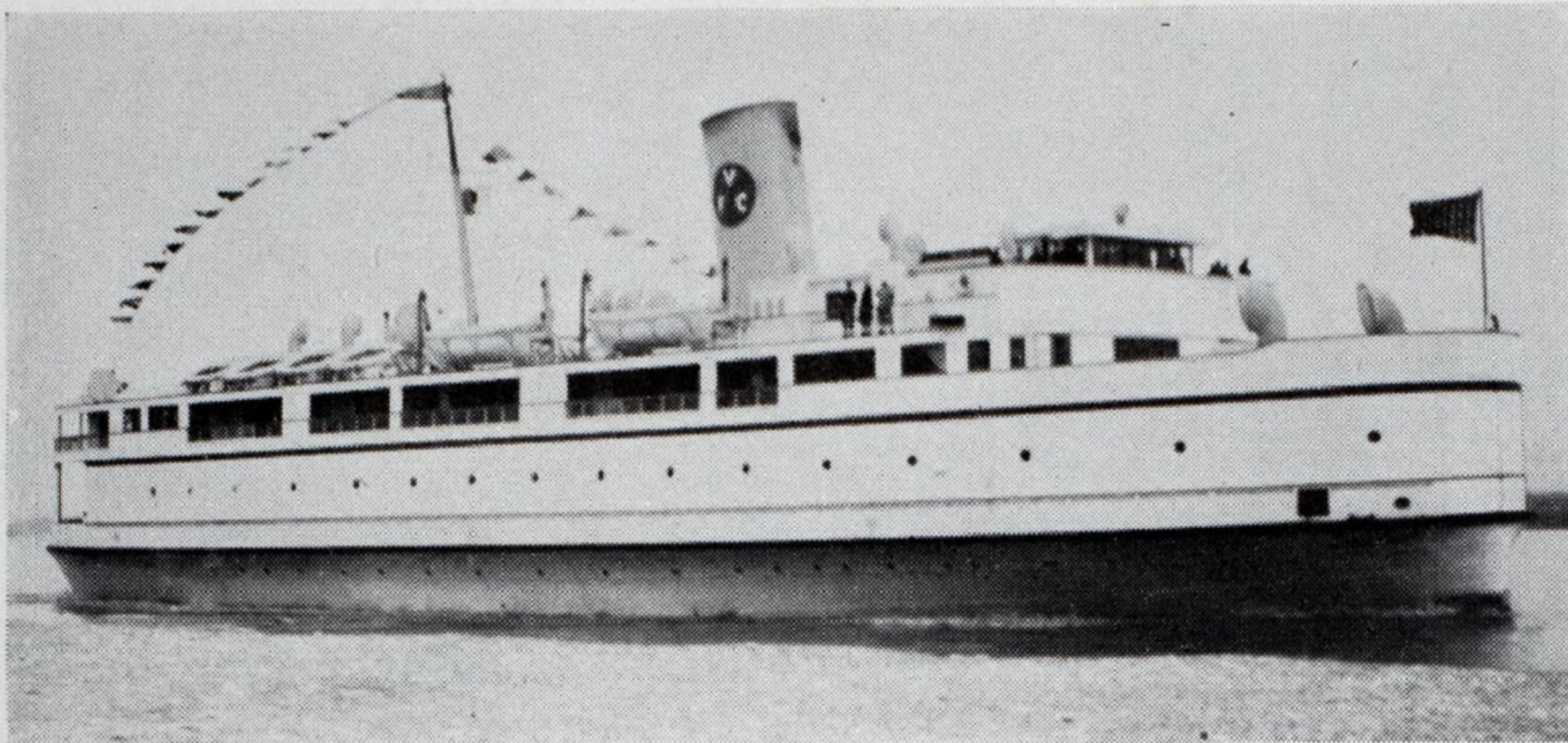
Clocks—Chelsea Clock Co. (partly)

Windows—Kearfott; Henry Hope & Co.

Manila Rope—Columbian Rope Co.



DELMARVA—Transport Ferry—Twin Screw—Steam



DESCRIPTION

The performance of this vessel has exceeded anticipation. She has unusually well arranged and pleasing passenger accommodations. By efficient use of the main deck six lanes are provided for approximately 80 automobiles. Unaflo marine steam engines are used for main propelling power in twin screws.

Name—DELMARVA
Owner—The Virginia Ferry Corp.
Builder—The Pusey and Jones Corp.
Naval Architect—W. R. Elsey; G. G. Sharp
Launched—Nov. 2, '33; Comp. Jan. 4, 1934
Classification—Not classed; but equal to American Bureau requirements.

HULL PARTICULARS

Length over all, 260 feet; length between perpendiculars, 250 feet; breadth molded, 59 feet; depth molded, 19 feet, 1 inch; load draft, 10 feet, 6 inches; displacement loaded, 1680 tons; gross tonnage, 1496.99; net tonnage, 821; passenger capacity, 300 white, 120 colored; cargo capacity, about 80 automobiles; bunker fuel oil capacity, in tons, 57.6; speed, 18 miles per hour.

MACHINERY PARTICULARS

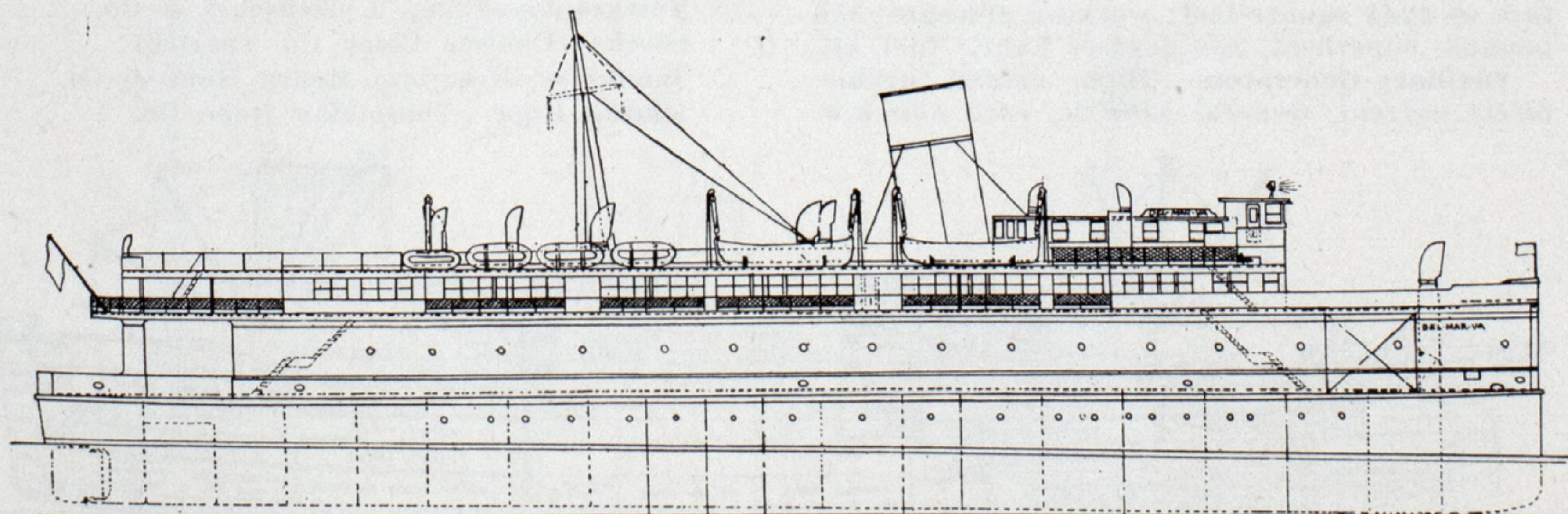
Main Engines—Two, vertical, unaflo reciprocating marine steam engines; four cylinders, 19 inches in diameter and 20 inches stroke. Each engine develops 1400 shaft horsepower at 200 revolutions per minute.

Boilers—Two, Babcock & Wilcox watertube marine boilers with a total heating surface of 7652 square feet; working pressure, 290 pounds per square inch; superheat, 200 degrees Fahr.; fuel, oil. Superheaters, and de-superheaters were supplied by The Babcock & Wilcox Co., soot blowers by Diamond Power Specialty Corp. Fuel oil burning equipment was supplied by Todd Combustion Equipment Inc.

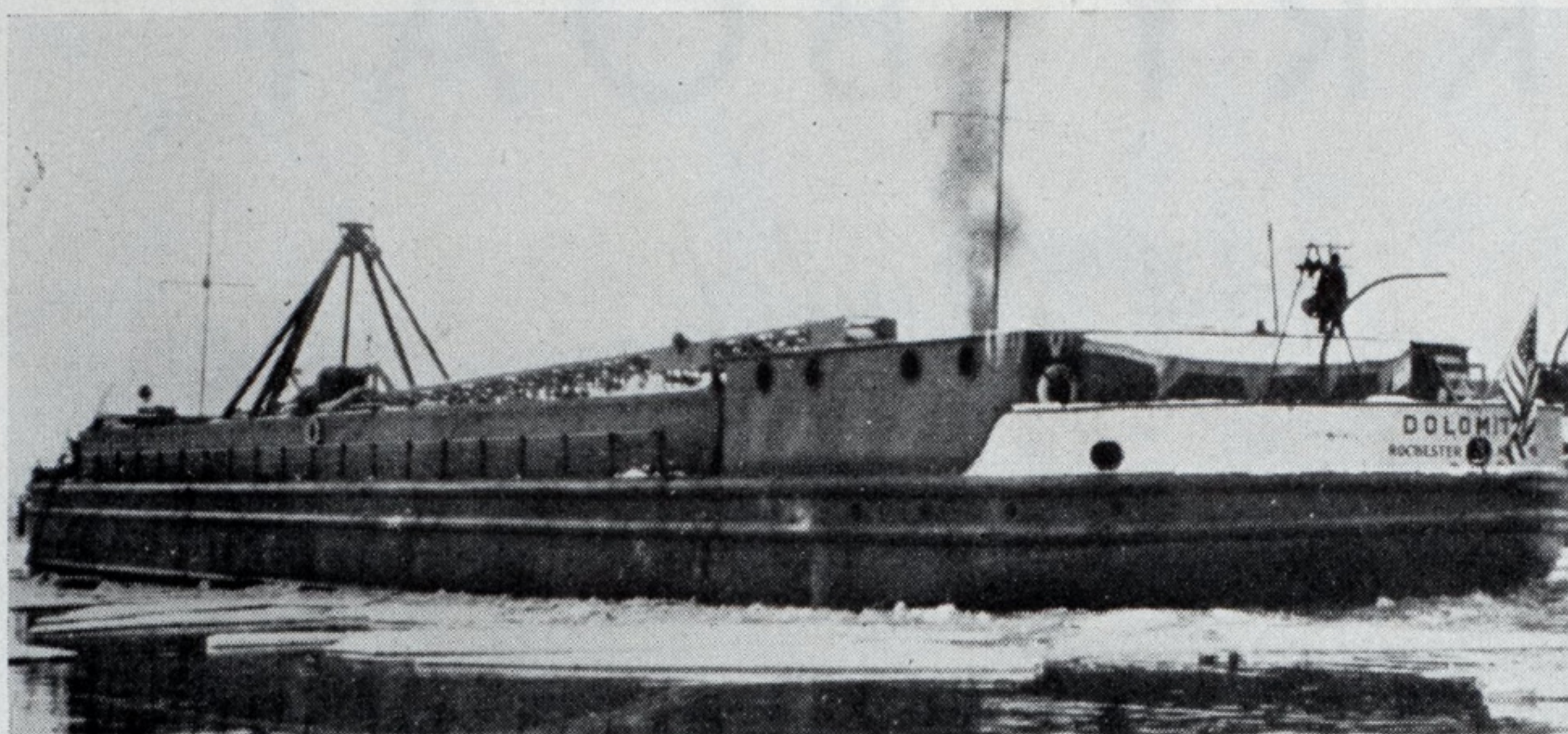
Generator Sets—Two, 50 k.w., geared turbine generator sets; direct current, 125 volts. A 16-cell storage battery, for emergency lighting, supplied by The Electric Storage Battery Co.

AUXILIARY EQUIPMENT

Pumps—Warren Steam Pump Co.; Westco
Main Condenser—Ingersoll-Rand Co.
Air Ejectors—Ingersoll-Rand
Windlass, Capstans—Lidgerwood Mfg. Co.
Gypsy, Double (Electric)—Lidgerwood
Steering Gear—Lidgerwood Mfg. Co.
Anchor; Chain—Baldt Anchor C. & F. Co.
Propellers—F. Ferguson & Son
Thrust Bearings—Kingsbury Machine Works
Refrigeration—Frigidaire Corp.
Rudder, Simplex—Th. Goldschmidt Corp.
Oil Purifier—The Sharples Specialty Co.
Stern Bearings—Rubber, B. F. Goodrich Co.
Heating, Ventilating—Carrier-Brunswick
Copper, Brass—The American Brass Co.
Floor Plates—Central Iron & Steel Co.
Deck Covering—Selby, Battersby Co.
Valves—The Lukenheimer Co.; Wm. Powell
Safety Valves—Ashton Valve Co.
Throttle Valves—Schutte & Koerting
Feed Water Heater—Davis Engineering Co.
Oil Coolers, Pumps—Schutte & Koerting
Wrought Iron Pipe—A. M. Byers Co.
Marine Hardware—The Dayton Mfg. Co.
Galley Equip. Etc.—Elisha Webb & Son Co.
Lifeboats, Davits—Welin Davit & Boat Corp.
Clocks—Chelsea Clock Co.



DOLOMITE NO. 1 —Self-Unloader—Canals—Twin Screw—Diesel Electric



DESCRIPTION

The largest all-welded steel freighter so far built in the United States. Channels bent cold to the shape of the transverse sections are welded together at toe and heel to form the hull of the vessel. Equipped for self-unloading, either liquid or dry cargo. Speed 12 knots.

Name—Dolomite No. 1

Owner—Dolomite Marine Corp., Rochester

Builder—Dolomite Marine Corp.

Designed by—J. H. Odenbach; J. Cattanaach

Launched—Oct. 20, '33; Comp. Feb. 1934

Classification—American Bureau of Shipping

HULL PARTICULARS

Length over all, 214 feet; length between perpendiculars, 205 feet, 4 inches; breadth molded, 32 feet; depth molded, 13 feet, 4 inches; draft loaded, 10 feet, 6 inches; displacement loaded, 1800 tons; gross tonnage, 934; net tonnage, 478; cargo capacity, in cubic feet, liquid, 48,730; or bulk, 37,200; total bulk and part liquid, 52,330; cargo capacity, in tons, 1200; bunker diesel fuel capacity, in tons, 22; speed, 12 knots.

MACHINERY PARTICULARS

Main Engines—Two, 6-cylinder, 4-cycle, air injection, 14¼-inch bore and 14½-inch stroke type 6-MA-85, built by Busch-Sulzer Bros. Diesel Engine Co. Each engine develops 440 brake horsepower at 360 revolutions per minute, and is direct connected to an electric generator.

Main Generators—Two, each 316 kilowatts, 300 volts, direct current built by Diehl Mfg. Co. Each of these generators is driven by one of the above-mentioned diesel engines at 360 revolutions. Each main engine also drives one 25-kilowatt, 125 volts auxiliary generator. Excitation is supplied by a 1900 ampere-hour storage battery.

Main Propulsion Motors—Two, direct current, each 350 horsepower at 360 revolutions per minute, 85 to 325 volts of Diehl Mfg. Co. make.

Each propelling motor is direct connected to a four-bladed cast steel propeller, 5 feet, 6 inches in diameter and 38 inches in pitch.

Auxiliary Generators—Three, of which two each 25 k.w., 125 volts, are driven by a link belt from each engine; the third is independently driven by a 4-cylinder, Winton diesel engine, Westinghouse generator, 32 k.w., 125 volts.

AUXILIARY EQUIPMENT

Pumps—Northern (principally); Worthington

Windlass—American Hoist & Derrick Co.

Steering Gear—Hyde; Waterbury Pump.

Propellers—E. H. Reading Co.

Refrigeration—Frigidaire

Oil Cooler—Schutte & Koerting

Filter—Elliott (for stern bearings)

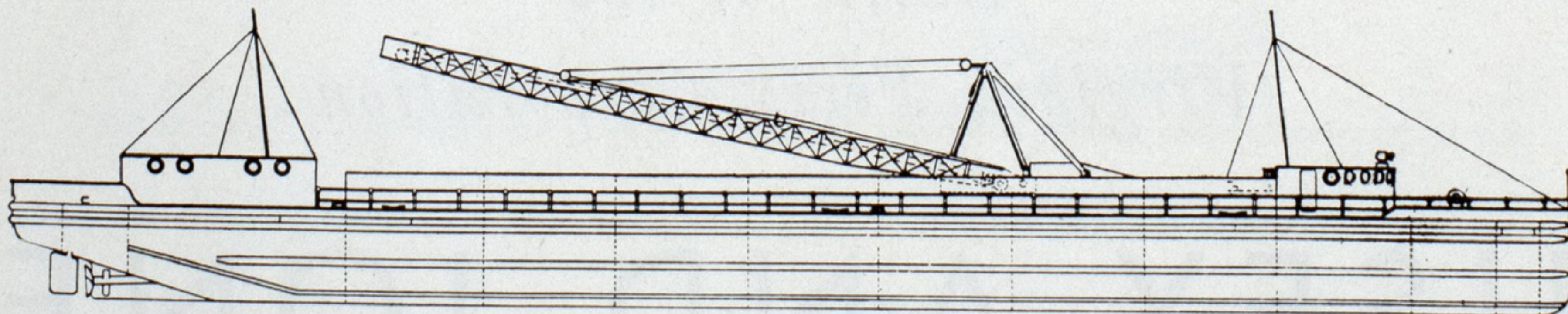
Oil Purifier—The Sharples Specialty Co.

Manila Rope—Columbian Rope Co.

REMARKS

It is estimated that approximately 25 per cent has been saved in deadweight by welded construction. An elaborate belt conveyor and pumping system makes it possible to discharge either bulk or liquid cargo. Depending on the cargo, the vessel may be loaded in from one to six hours and unloaded in from three to six hours.

During the cold month of February the Dolomite No. 1 made her way successfully from Albany to New York through from 8 to 14 inches of solid ice without sustaining the slightest damage. Designed for service on the Barge canal, the Great Lakes, and as may be necessary for limited coastwise service. A complete description appeared in MARINE REVIEW for September, 1933.



BURGESS—Dredge—Rivers—Twin Screw—Steam

DESCRIPTION

The dredge BURGESS and sister vessel JADWIN are of the dust-pan suction head type and were built for the United States war department for the district office of the Engineer Corps. at Memphis, Tenn. They were built for river dredging service. A powerful impeller type of pump is used for dredging.



Name—BURGESS

Owner—United States Engineers, Memphis

Builder—Marietta Mfg. Co.

Naval Architect—U. S. Engineers, Memphis

Launched—Nov. 25, '33; Comp. Feb. 28, '34

Sister Ship—JADWIN; Launched, Oct. 28, '33
Completed, Feb. 5, 1934.

Classification—Owner's requirements

HULL PARTICULARS

Length over all, 249 feet, 8 inches; length between perpendiculars, 244 feet; breadth molded, 52 feet; depth molded, 9 feet; draft, 6 feet; displacement loaded, 1880; gross tonnage, 1052; net tonnage, 1341; bunker fuel oil capacity, in tons, 180; speed, 10 miles per hour.

MACHINERY PARTICULARS

Main Engines—Two, vertical, triple expansion steam engines, 12 x 20 x 33 inches by 24 inches stroke. Each engine has a rating of 1000 horsepower at 190 revolutions per minute. Built by Nordberg Mfg. Co. Each engine is direct connected to a propeller which operates in a partial tunnel.

Boilers—Four, watertube marine boilers, of cross-drum type, with a total heating surface of 12,600 square feet. These boilers were built by Hedges-Walsh-Weidner. A total of 60,000 pounds of steam is generated per hour, at 250 pounds working pressure per square inch, and 150 degrees Fahr. superheat; fuel, oil. Superheaters supplied by The Superheater Co.; and soot blowers by the Diamond Power Specialty Corp. Oil burning equipment by Todd Combustion Equipment Inc.

Generating Sets—Two, turbine driven, 25 kilowatts, supplied by General Electric Co.

Dredging Pump—One, impeller type, designed by the U. S. Engineers, having 32-inch suction and discharge, and an 80-inch diameter impeller. Built by Hardie-Tynes; driven by a Moore mixed pressure multi-stage steam turbine, developing 1800 horsepower at 3600 r.p.m. through a Falk Corp. double reduction gear.

AUXILIARY EQUIPMENT

Pumps—Worthington Pump & Mach. Corp.

Steam Capstans—American Engineering Co.

Winches—J. S. Mundy; Clyde Iron Works

Oil Purifier—The De Laval Separator Co.

Steering Engine—Marietta Mfg. Co.

Thrust Bearings—Kingsbury Machine Works

Propellers—Erie Forge Co.

Safety Valves—Ashton Valve Co.

Refrigeration—York Ice Machinery Corp.

Gages—Ashton Valve Co.

Wrought Iron Pipe—A. M. Byers Co.

Compressor Engine—Troy Eng. Mach. Co.

Galley Equipment—Elisha Webb. & Son Co.

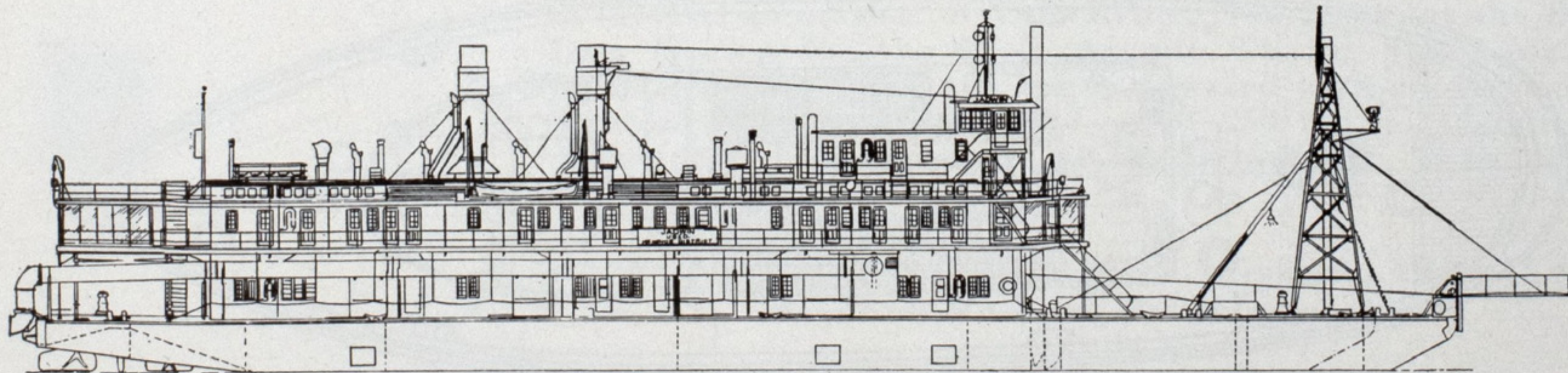
Marine Hardware—The Dayton Mfg. Co.

Valves and Fittings—Crane Co.

REMARKS

These two dredges, of substantial steel construction, cost approximately \$1,000,000. Each dredge has accommodations for a crew of 60 officers and men.

When using 600 feet of 32-inch diameter discharge pipe, these dredges are capable of moving 3600 yards of material an hour. In handling water, they have a capacity of 94,000,000 gallons per day. Each dredge is outfitted with a complete machine and repair shop. Water distilling plant, electric refrigeration, oil burning stoves, laundry, and radio apparatus are included in the equipment.



TURECAMO GIRLS—Tug—Harbors—Single Screw—Diesel



DESCRIPTION

In all details of construction and equipment this diesel driven harbor tug is one of the finest vessels of her type. Utmost care was used to secure maximum efficiency and also a neat and shipshape appearance. The hull is divided by four transverse watertight bulkheads.

Name—TURECAMO GIRLS
Owner—B. Turecamo Towing Co.
Builder—Bath Iron Works Corp.
Naval Architect—Brown & Demarest
Launched—May 6, '33; Comp. May 12, '33

HULL PARTICULARS

Length over all, 93 feet; length between perpendiculars, 86 feet, 10 inches; breadth molded, 23 feet; depth molded, 11 feet; draft, mean, 8 feet, 11 inches; displacement loaded, 258 tons; gross tonnage, 148; net tonnage, 76; bunker diesel fuel, in tons, 49.1; speed, 10.4 knots.

MACHINERY PARTICULARS

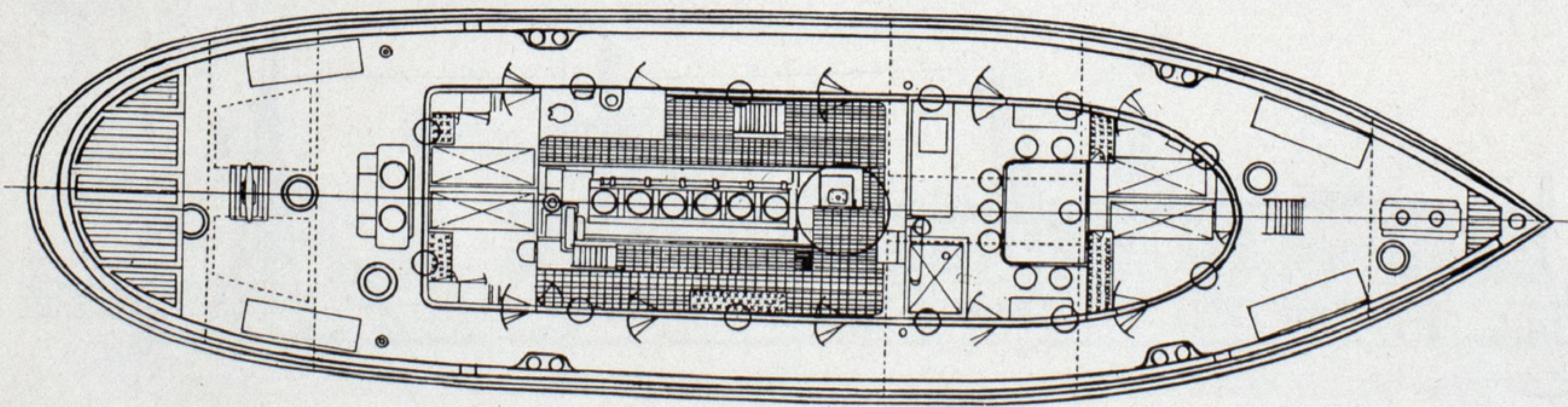
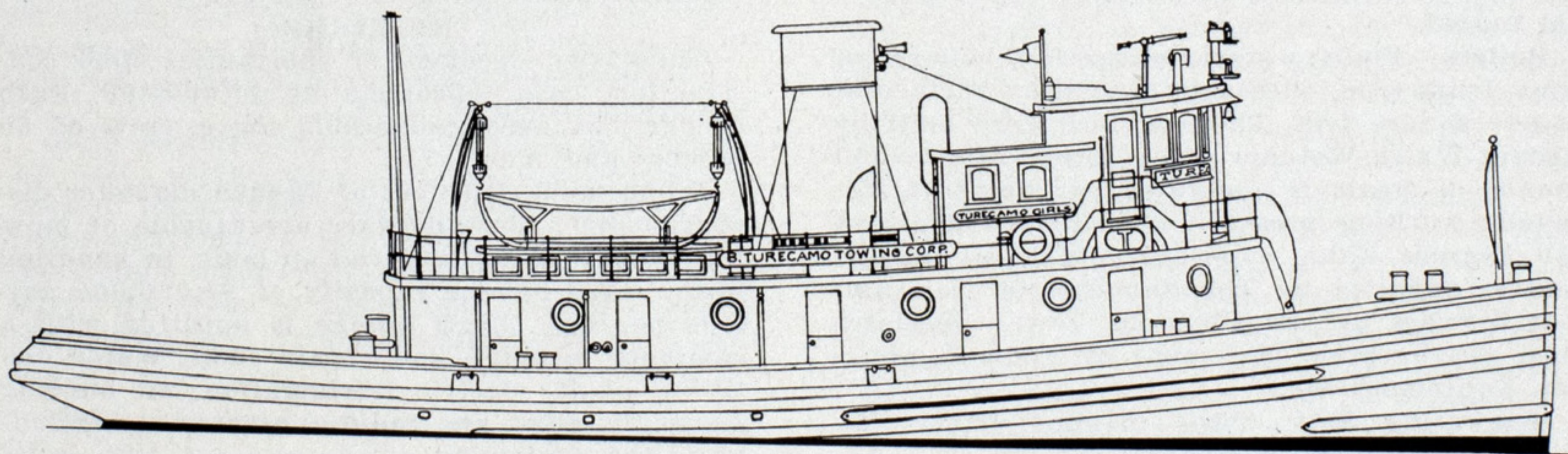
Main Engine—One, 6-cylinder, 4-cycle, solid injection diesel engine, 15½-inch bore by 22 inch stroke, built by Winton Engine Corp. Develops 600 horsepower at 250 revolutions per minute.

Auxiliary Generators—One, 10 k.w. 125 volts, Winton diesel engine driving Electro-Dynamic

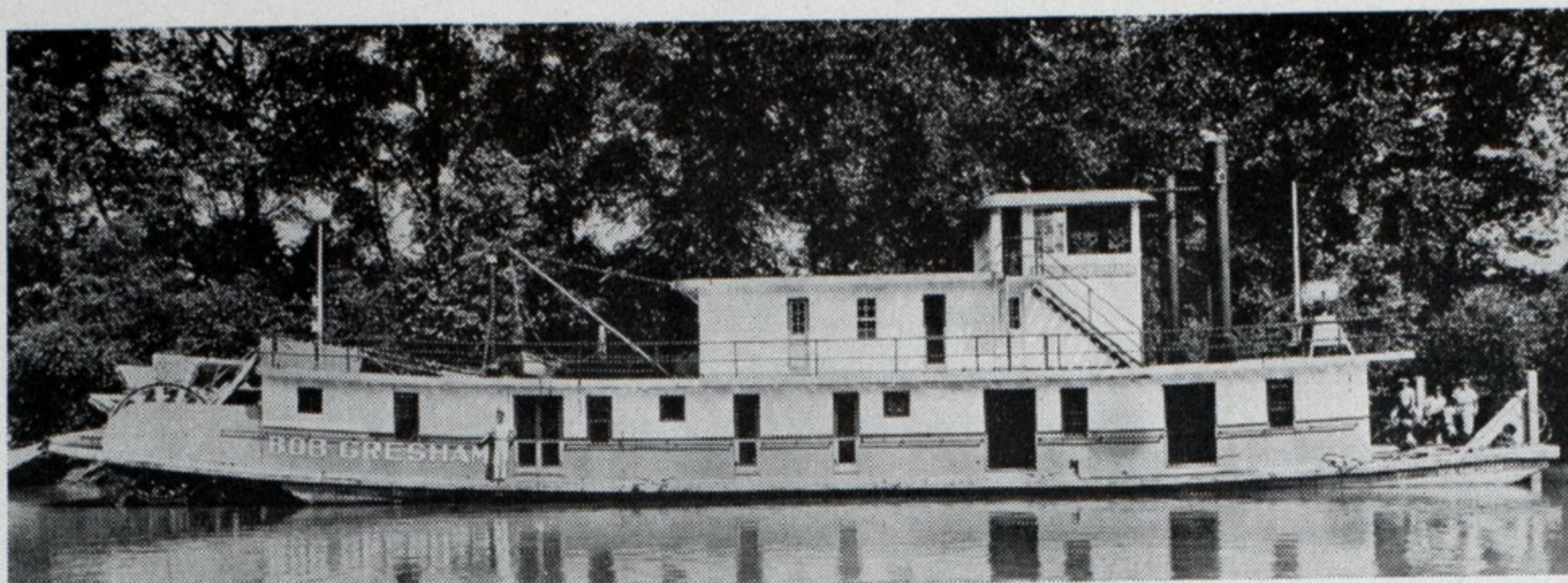
Co. generator. Also one 10 k.w., 125 volts, Electro-Dynamic driven from main engine.

AUXILIARY EQUIPMENT

Pumps—Carter; Westco; Decatur, others
Steering Gear—American Engineering Co.
Gypsy, Electric—American Engineering Co.
Propeller—United Dry Docks Inc.
Refrigeration—General Electric Co.
Rudder, Simplex—Th. Goldschmidt Corp.
Fire Extinguishers—Walter Kidde & Co.
Thrust Bearings—Kingsbury Machine Works.
Lifeboat—Welin Davit & Boat Corp.
Valves Fittings—Lukenheimer; Crane
Galley Range—Elisha Webb & Son
Stern Bearings—Rubber, B. F. Goodrich Co.
Oil Purifier—Goulds Pumps Inc.
Manila Rope—Columbian Rope Co.
Deck Covering—Selby Battersby & Co.
Clocks—Chelsea Clock Co.



BOB GRESHAM—Towboat—Rivers—Sternwheel—Diesel



DESCRIPTION

This modern steel hull and steel superstructure river towboat is one of the latest vessels added to the fleet of the owner in transportation of bulk commodities including structural steel, asphalt rock, gasoline and other products.

Name—BOB GRESHAM

Owner—W. G. Houghland, Bowling Green, Ky.

Builder—Nashville Bridge Co., Nashville

Naval Architect—Nashville Bridge Co.

Launched—Apr. 28, '33; Comp. Aug. 14, '33

Classification—Owner's requirements

HULL PARTICULARS

Length over all, 131 feet; length between perpendiculars, 100 feet; breadth, molded, 24 feet; depth molded, 4 feet, 6 inches; draft, 3 feet, 2 inches; bunker diesel fuel capacity, in tons, 36; speed, 10 statute miles per hour.

MACHINERY PARTICULARS

Main Engine—One, Fairbanks-Morse Co., two cycle, six cylinder, solid injection, diesel engine, connected by means of gearing and chain drive to sternwheel operating at 22 revolutions per minute. Brake horsepower of engine is 300 at 360 revolutions per minute; cylinder diameters $10\frac{1}{2}$ inches by stroke of $12\frac{1}{2}$ inches. This engine is known as model 37F-M.

Auxiliary Generator—One, 15 kilowatts, 125 volts, driven by a Fairbanks-Morse diesel engine; a 5 horsepower direct current motor is connected to the same shaft. There is also a 56-cell electric storage battery for lighting and for operating the smaller electric motors.

AUXILIARY EQUIPMENT

Pumps—Fairbanks-Morse Co.

Steering Gear (Steam)—Gardner

Searchlight—Carlisle & Finch Co.

Plumbing, Valves, Fittings—Crane Co.

Gear Transmission—Keck-Gonnerman Co.

Galley Range—Elisha Webb & Son Co.

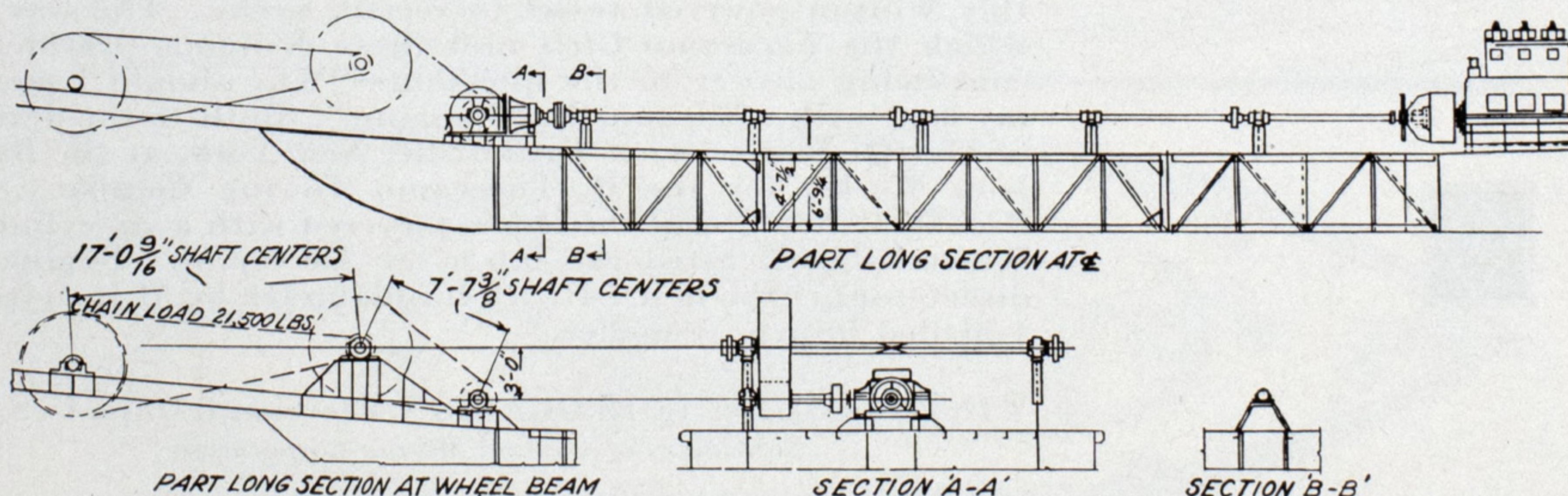
REMARKS

The BOB GRESHAM which was designed and built for the owner, Capt. W. G. Houghland, Bowling Green, Ky., by the Nashville Bridge Co., Nashville, Tenn., entered service without the formality of a trial trip. On her maiden voyage, from Nashville to the mouth of the Cumberland river, she towed three steel barges and returned to Nashville on a rising river with these barges loaded with 1500 tons of steel.

Since this initial voyage, the BOB GRESHAM has been continuously in service towing barges loaded with gasoline for the Apex Oil Corp., Nashville,

As always in the installation of a diesel engine to a sternwheel drive the method of transmitting the power to the paddle wheel is of special interest. In the BOB GRESHAM the six cylinder, 300 horsepower, diesel engine is located on the centerline of the main deck, so that the center of the engine clutch is about 70 feet forward of the transom line at the stern. The center of the stern wheel is 11 feet aft of the same transom line. The centerline of the line shafting is 2 feet, $1\frac{1}{2}$ inches above the deck and is supported in five journal bearings. The shaft is $4\frac{7}{8}$ inches in diameter.

Power to the sternwheel which is 15 feet, 6 inches in diameter by 16 feet wide with 27 wooden buckets, is transmitted from the engine line shafting by beveled gears through chain reduction to a lay shaft and thence by sprocket chain reduction drive, from both ends of lay shaft to the sternwheel itself, which operates at 22 revolutions per minute. Sternwheel shaft is split at the center bearing.



WISTARIA—Lighthouse Tender—Single Screw—Diesel Electric

DESCRIPTION

Of steel construction the WISTARIA is used in the lighthouse service on the Delaware river. The main propelling unit is diesel electric. Two diesel engine driven generators supply 250-volt direct current for the 240 shaft horsepower at 400 r.p.m. electric motor direct connected to propeller.



Name—WISTARIA

Owner—U. S. Lighthouse Service

Builder—United Drydocks Inc.

Naval Architect—U. S. Lighthouse Service

Launched—Feb. 3, '33; comp., Mar. 30, '33

Classification—Owner's requirements

HULL PARTICULARS

Length over all, 121 feet, 4 inches; length between perpendiculars, 111 feet, 8 inches; breadth molded, 25 feet; depth molded, 9 feet; draft, 6 feet, 8 inches; displacement loaded, 323 tons; cargo capacity, 70 tons; bunker diesel fuel oil capacity in gallons, 3300; speed in service, 9 3/4 knots.

MACHINERY PARTICULARS

Main Engines—Two, 6-cylinder, 4-cycle, solid injection, 8 1/2 x 11 inches, diesel engines built by Winton Engine Corp. Each engine, developing 175 horsepower at 450 revolutions per minute, is direct connected to a 100-kilowatt General Electric direct current generator.

Main Propulsion Motor—One, of 240 shaft horsepower, 250 volt, direct current, General Electric motor. This motor is direct connected, through a Kingsbury thrust, with the propeller.

Auxiliary Generator—One, 7 1/2-kilowatt, direct current, General Electric generator, driven by a Winton diesel engine.

AUXILIARY EQUIPMENT

Pumps—Dean; Winton

Windlass—Lidgerwood Mfg. Co.

Hoister—Lidgerwood Mfg. Co.

Steering Gear—hand—Lidgerwood Mfg. Co.

Electric Motors—General Electric; Diehl

Propeller—United Dry Docks Inc.

Refrigeration—Brunswick; Frigidaire

Heating Boiler—Almy

Anchor—Baldt Anchor Chain & Forge Co.

Valves and Fittings—Crane Co.

Direction Indicator—Alexander McNab

Revolution Counters—Alexander McNab

Compressors—Winton; General Electric

Galley Equipment—Stamford Foundry Co.

Brass, Copper—American Brass Co.

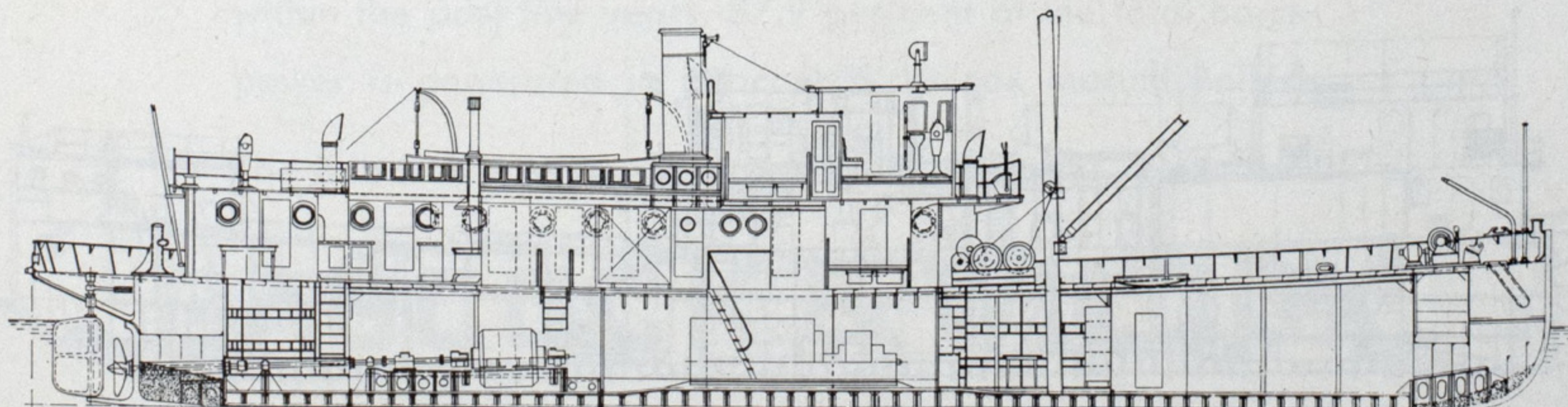
REMARKS

The WISTARIA, a single screw, diesel electric propelled steel vessel designed specially for the duties of the lighthouse service in the waters of Delaware bay and river, was delivered early in April, 1933. The contract for building this vessel was awarded late in July, 1932, to United Dry Docks Inc. at a low bid of \$129,900. Delivery was called for within 240 days.

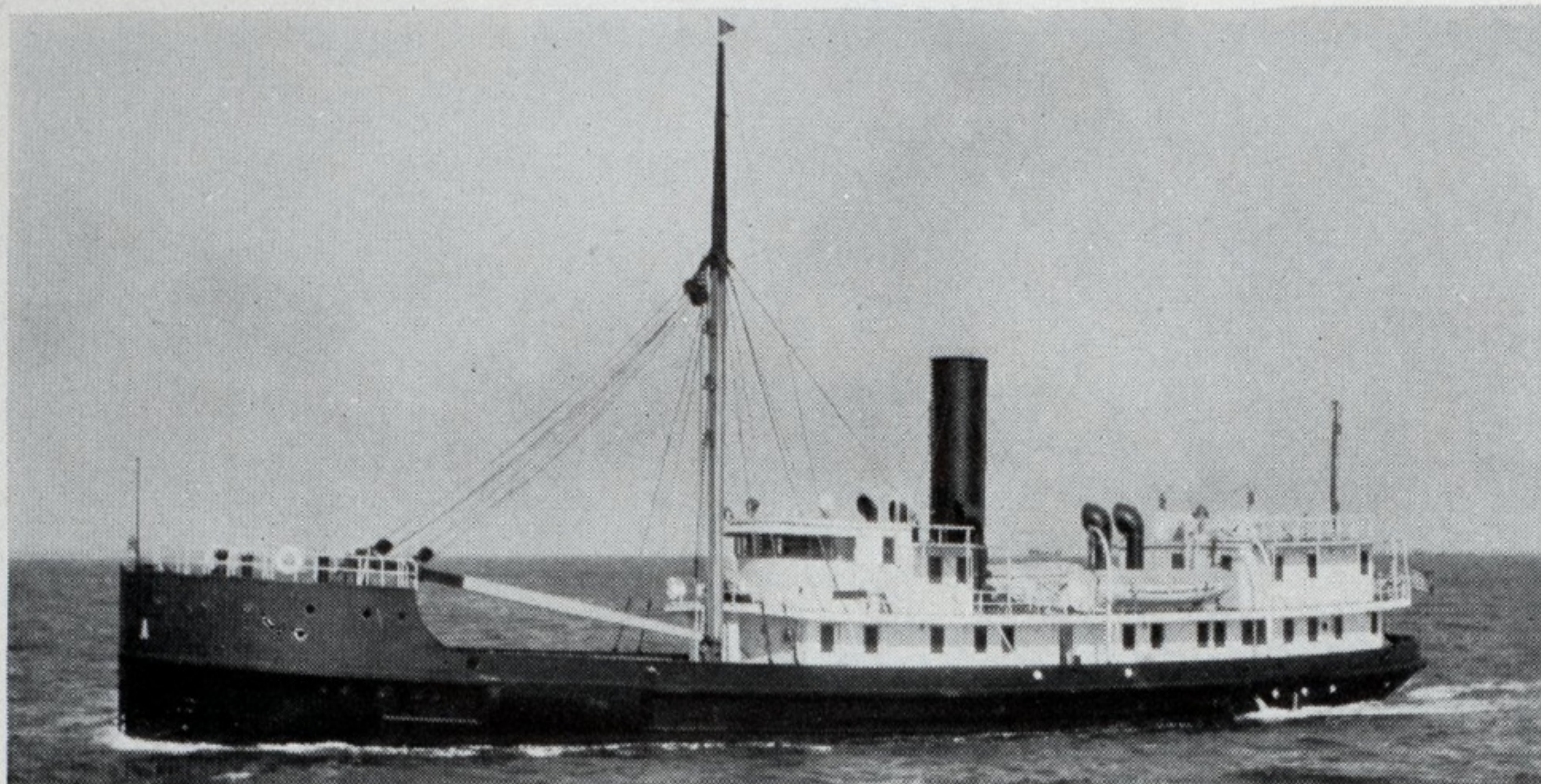
She has replaced the small wooden steamer Woodbine, embodies many improvements, and will be principally used in the construction of new navigation aids and in servicing existing lights and buoys.

For heavy lifts there is fitted a 38-foot boom of 10 tons capacity served by a four-drum electric driven hoist of Lidgerwood design and construction.

The superstructure, of steel construction, is located mainly over the after half of the vessel leaving a spacious forward deck for handling buoys and other lighthouse equipment. The pilot house is located on the forward end of the superstructure.



LILAC—Lighthouse Tender —Bays—Twin Screw—Steam



DESCRIPTION

The design of this vessel is based on the experience of the lighthouse service, and she is especially adapted to meet all the requirements in a most efficient manner. The LILAC was completed Aug. 11, 1933 and entered service in the fourth lighthouse district, Philadelphia.

Name—LILAC

Owner—United States Lighthouse Service

Builder—The Pusey & Jones Corp.

Naval Architect—U. S. Lighthouse Service

Launched—May 26, '33; **Comp.** Aug. 11, 1933

Classification—Lighthouse Service Tender

HULL PARTICULARS

Length over all, 170 feet; length between perpendiculars, 163 feet, 6 inches; breadth molded, 32 feet; depth molded, 13 feet; draft, 10 feet; displacement loaded, 770 tons; cargo capacity, 200 tons; bunker fuel oil capacity in gallons, 30,000; speed at sea, 13 knots.

MACHINERY PARTICULARS

Main Engines—Two, triple expansion, reciprocating steam engines, each of 500 indicated horsepower at 160 revolutions per minute, built by J. W. Sullivan Co. Size of engines, 11½ x 19 x 32 inches and 24 inches stroke.

Boilers—Two, Babcock & Wilcox watertube marine boilers with a total heating surface in the two boilers of 4880 square feet; working pressure, normal, 200 pounds per square inch; fuel, oil. Oil burning equipment, and firebrick, supplied by the Babcock & Wilcox Co.

Auxiliary Generators—Two, General Electric.

AUXILIARY EQUIPMENT

Pumps—M. T. Davidson Co.

Windlass—Lidgerwood Mfg. Co.

Winch, Hoist—Lidgerwood Mfg. Co.

Steering Gear—Lidgerwood Mfg. Co.

Propellers—The Pusey & Jones Corp.

Refrigeration—Brunswick; Frigidaire

Copper, Brass—The American Brass Co.

Radiators—Chase Brass & Copper Co.

Indicator, Counter—Alexander McNab

Floor Plates—Central Iron & Steel Co.

Galley Range—Elisha Webb & Son Co.

Marine Hardware—Dayton Mfg. Co.

Plumbing, Valves, Fittings—Crane Co.

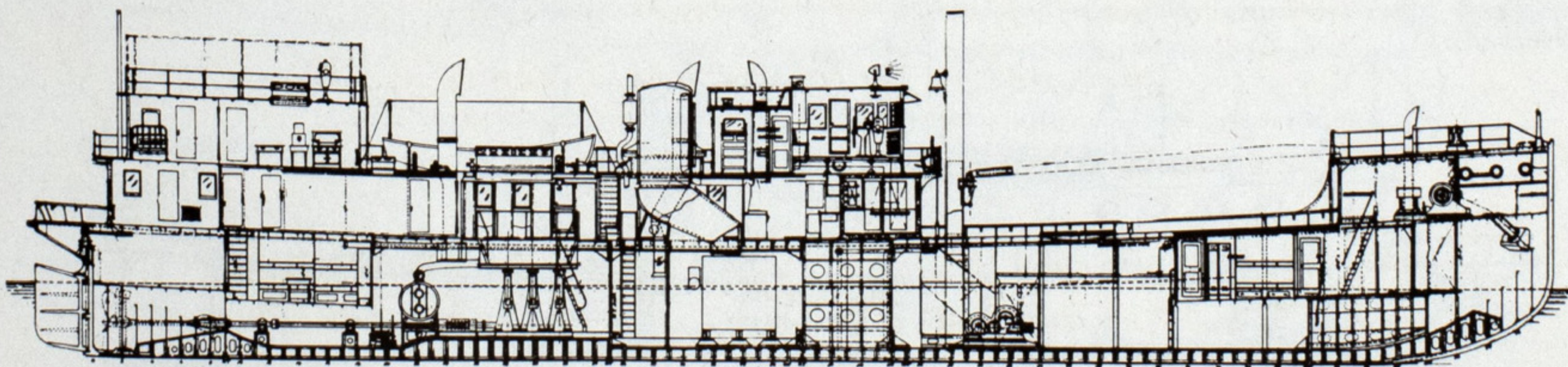
REMARKS

The LILAC is a twin screw, reciprocating steam engine propelled vessel, and is similar in most particulars to the ARBUTUS completed at the same yard some two months before. Including equipment, the cost of the LILAC is about \$225,000.

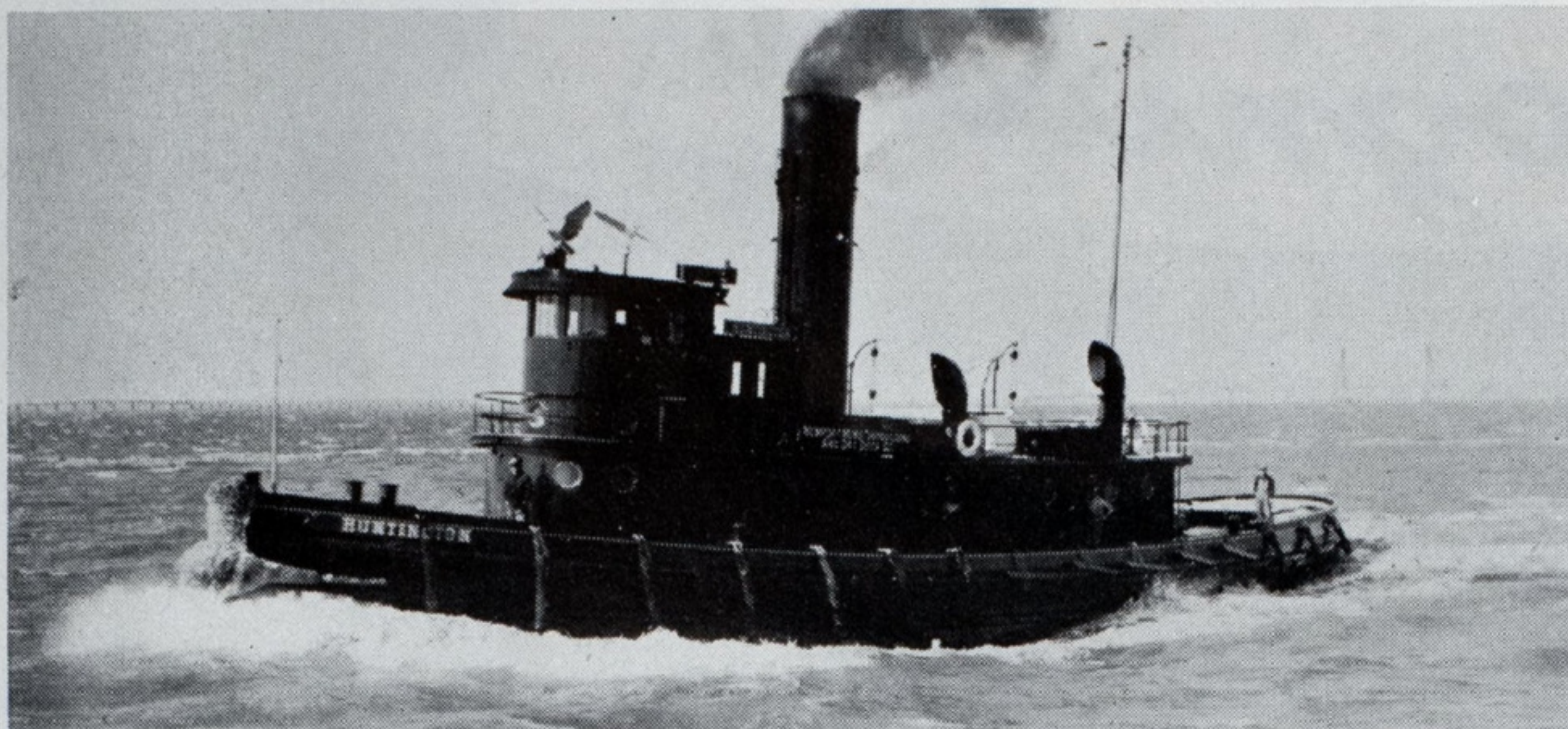
The boiler space is located immediately aft of amidships with fuel oil compartments between the boiler room and cargo hold. Trimming tanks are fitted in extreme bow and stern.

As in the other tenders of this type, there is a powerful four-drum 10 x 12 inches, twin-cylinder steam hoister which serves a 20-ton steel boom 50 feet long stepped on the mast forward of the superstructure. The hold is served by an 8½ x 9 feet hatch. The hoister is located in the after end of the cargo hold.

The pilot house with master's quarters and bath adjoining is located on the upper deck forward. On the same deck aft are located a stateroom for the superintendent, a spare stateroom, dining room and radio quarters.



HUNTINGTON—Tug—Harbors—Single Screw—Steam



DESCRIPTION

This tug was built by the shipyard for its own use. While the shell plating seams and butts, deck plating seams and butts, and frames and beams are riveted, electric welding has been extensively used in the floors, boiler foundation, and auxiliary foundations. This vessel embodies the latest and best ideas for the service intended.

Name—HUNTINGTON
Owner—Newport News S.B. & D.D. Co.
Builder—Newport News S.B. & D.D. Co.
Naval Architect—Newport News S.B. Co.
Launched—Oct. 11, '33; Comp. Nov. 18, '33
Classification—Not classed, but equal to classification requirements.

HULL PARTICULARS

Length overall, 109 feet; length between perpendiculars, 96 feet; 6 inches; breadth molded, 29 feet; depth molded, 14 feet, 6 inches; draft, 10 feet, 9 inches forward, and 12 feet, 9 inches aft; displacement loaded, 489 tons; gross tonnage, 271.19; net tonnage, 147; bunker fuel (coal) capacity in tons, 87; speed, 12 knots.

MACHINERY PARTICULARS

Main Engine—One, reciprocating compound steam engine of 800 indicated horsepower at 100 revolutions per minute, built by Newport News Shipbuilding & Dry Dock Co. Size of engine, 20 x 44 inches and 30 inches stroke.

Boiler—One, single ended, Scotch boiler, arranged for burning coal under natural draft,

with a working pressure of 160 pounds per square inch. The boiler is 16 feet dia. by 12 feet long.

Generator Sets—Two, supplied by Westinghouse Electric & Mfg. Co.; one of 3 kilowatts and the other of 5 kilowatts capacity.

AUXILIARY EQUIPMENT

Pumps—Warren Steam Pump Co. Inc.

Steering Engine—Hyde Windlass Co.

Propeller—Of cast iron, 10 feet diameter, 11 feet, 6 inches pitch, four bladed solid type

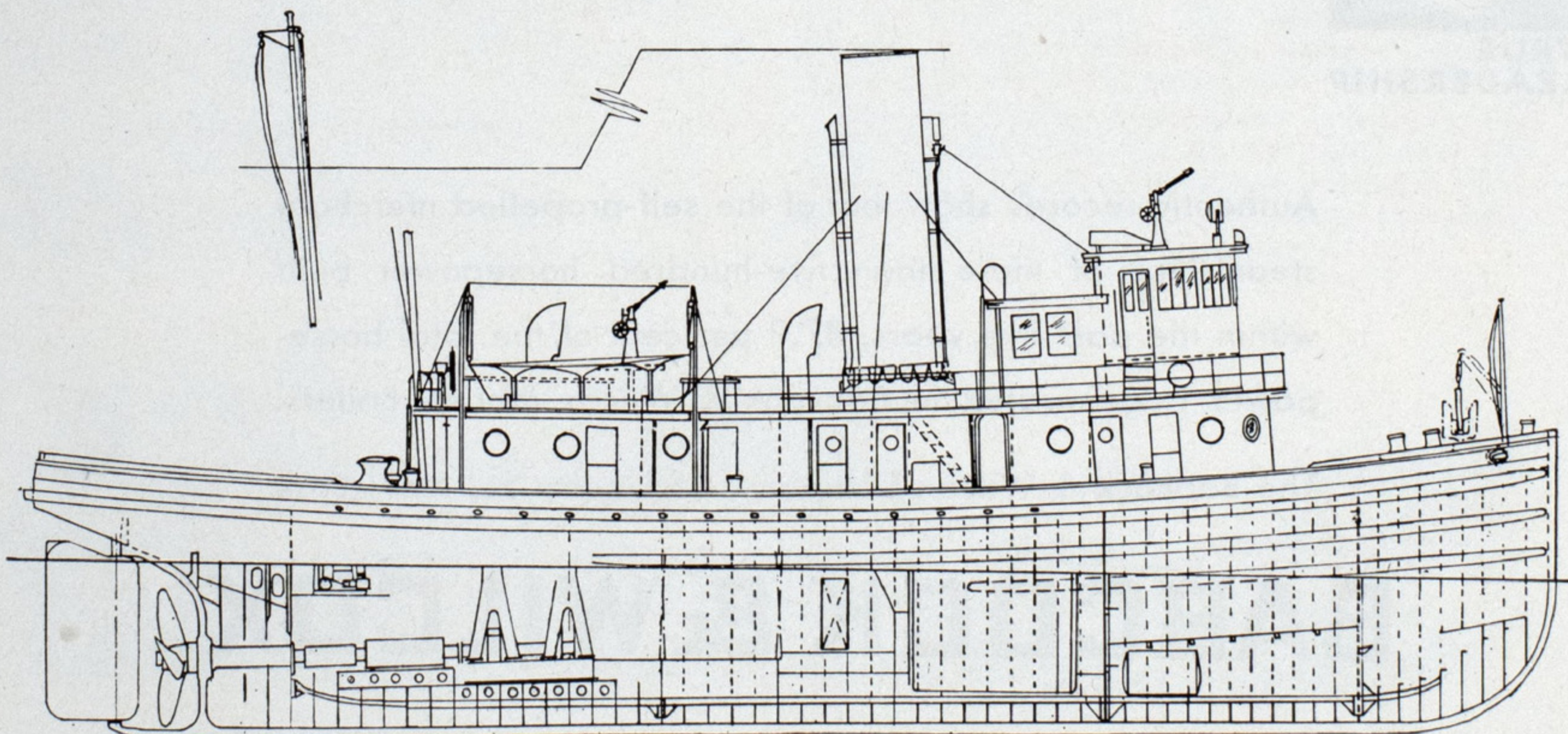
Valves and Fittings—Crane Co.

Marine Hardware—The Dayton Mfg. Co.

Lifeboats—Welin Davit & Boat Corp.

REMARKS

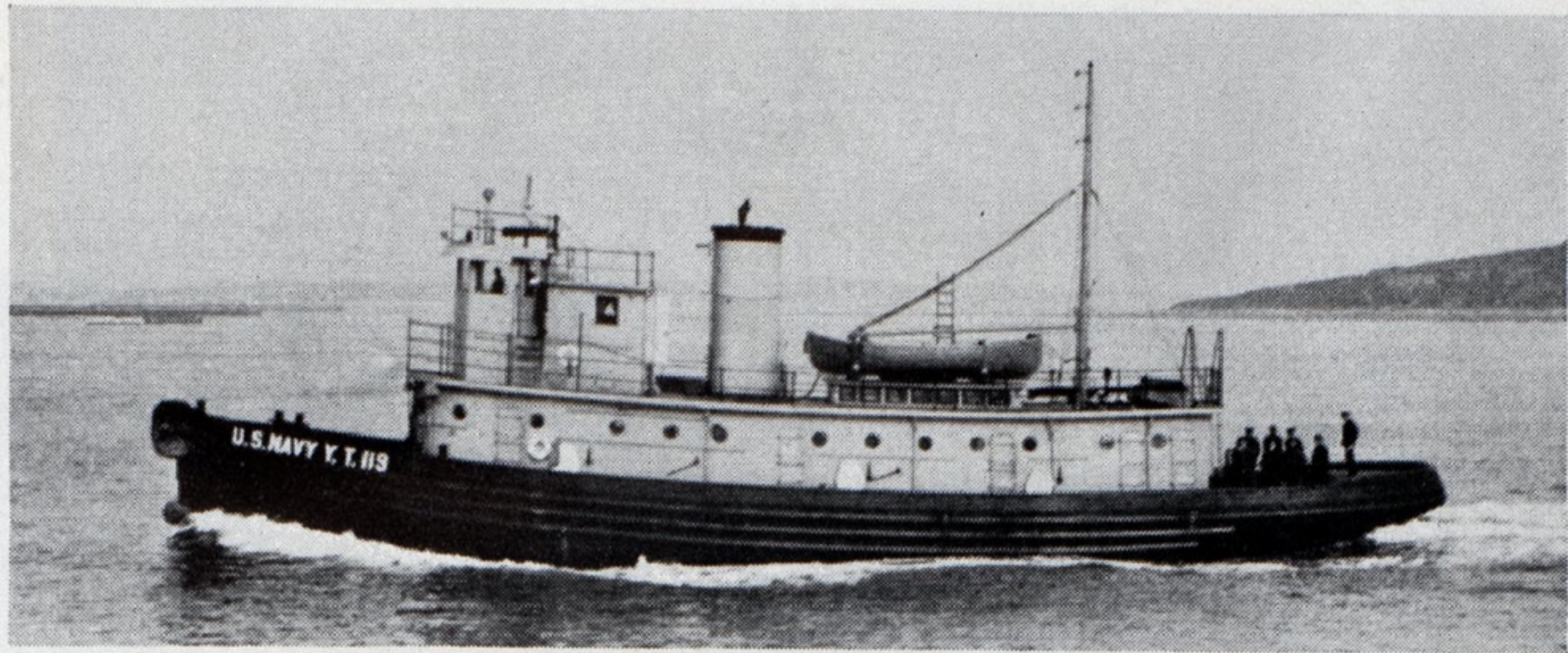
The HUNTINGTON is transversely framed, with a straight stem and elliptical stern. The stem, bar keel and stern frame are of wrought steel. The main deck is of steel covered with 3-inch Oregon pine decking. A steel bulwark is carried completely around the main deck, with a bulb angle cap rail, and 1 1/4-inch diameter electric welded braces. A white oak buffalo rail is mounted on the bulwark cap rail forward, and a chafing rail of the same material is fitted aft.



Y. T. 119—Tug—Harbors—Single Screw—Diesel Electric

DESCRIPTION

Diesel electric, all welded steel towboat, designed by the bureau of construction and repair, United States navy department. Built at the Boston navy yard. Commissioned March 7, 1933. For towing and general harbor work, Pearl Harbor, Hawaii. Speed, 12.6 knots.



Name—Y. T. 119

Owner—United States Navy

Builder—Navy Yard, Boston

Naval Architect—Bur. Construction & Repair

Launched—Dec. 19, '32; Comp. Mar. 7, '33

Classification—Owner's requirements

HULL PARTICULARS

Length over all, 110 feet, 3 inches; length between perpendiculars, 98 feet; breadth molded, 24 feet; depth molded, 13 feet, 6 inches; draft, mean, full load, 8 feet, 7 1/8 inches; displacement loaded, 300 tons; bunker diesel fuel oil capacity, in tons, 31; speed, on trial, 12.6 knots.

MACHINERY PARTICULARS

Main Engines—Two, 6-cylinder, 4-cycle, non-reversible, solid injection diesel engines, 12 1/2-inch bore by 20-inch stroke; built by McIntosh & Seymour Corp. Each engine develops 417 horsepower at 300 revolutions per minute, and is direct connected to an electric generator and exciter.

Main Generators—Two, each of 260 kilowatts, 250 volts, 1040 amperes, direct current, with an attached 35-kilowatt, 125-volt, 280 amperes direct current exciter; built by General Electric Co. Each of these generators is driven by one of the above-mentioned diesel engines at 300 revolutions.

Main Propulsion Motor—One, 640 horse-

power, double armature, 500 volts, and 1040 amperes, direct current, General Electric propelling motor.

Auxiliary Generator—One, 3-cylinder, 24-horsepower, Cummins diesel engine, driving one Electro-Dynamic generator 10 k. w., 120 volts, and one Ingersoll-Rand compressor.

AUXILIARY EQUIPMENT

Pumps—Three Worthington; one La Bour; one Northern, one Fairbanks-Morse

Air Compressor—Ingersoll-Rand compressor; Electro-Dynamic 20 h.p. electric motor.

Steering Engine—Electric, Lidgerwood

Windlass—Hyde Windlass Co.

Propeller—Philadelphia Navy Yard

Refrigeration—General Electric Co.

Heater—American Radiator Co.; oil burner, Automatic Burner Corp.

Thrust Bearings—Kingsbury Machine Works

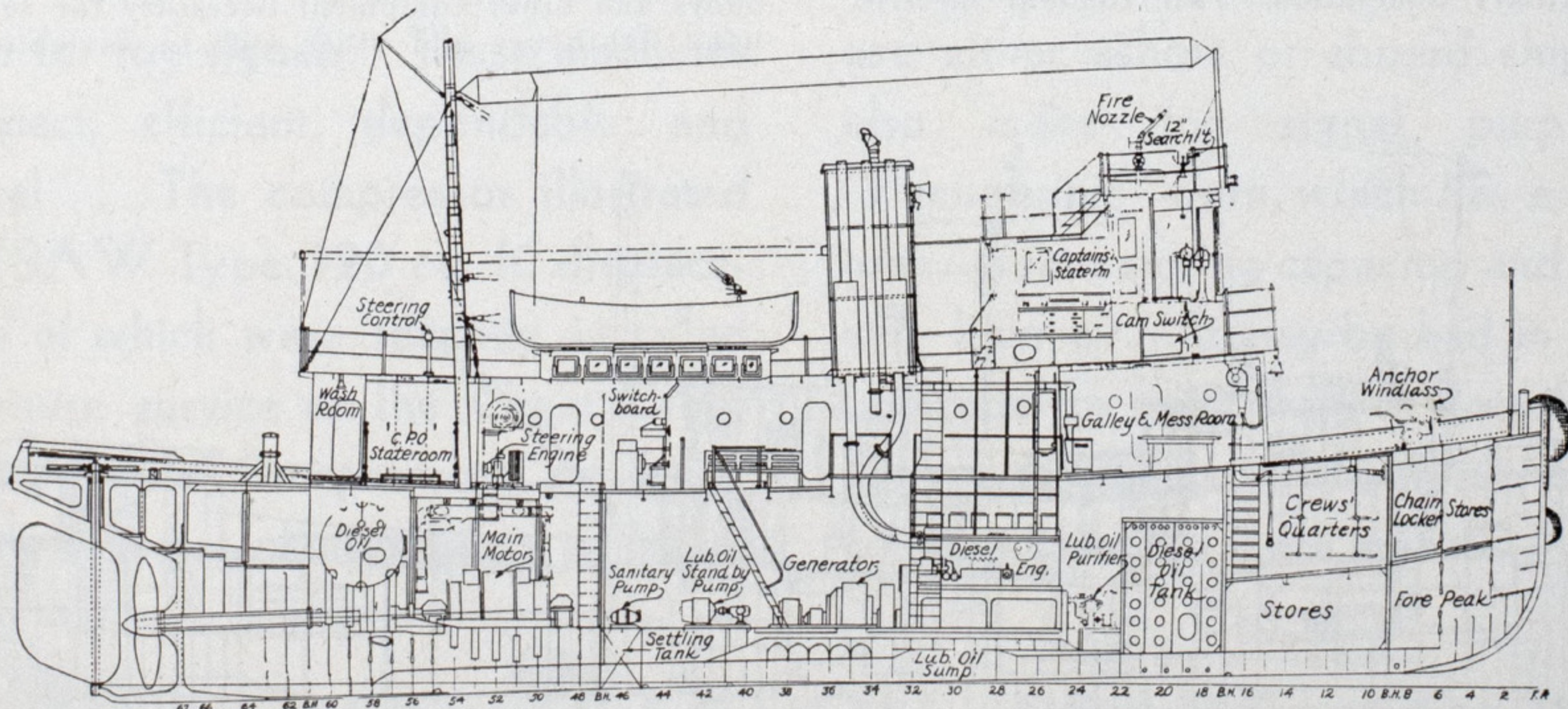
Galley Range—Elisha Webb & Son Co.

Galley Equipment—Edison G. E. Appliance

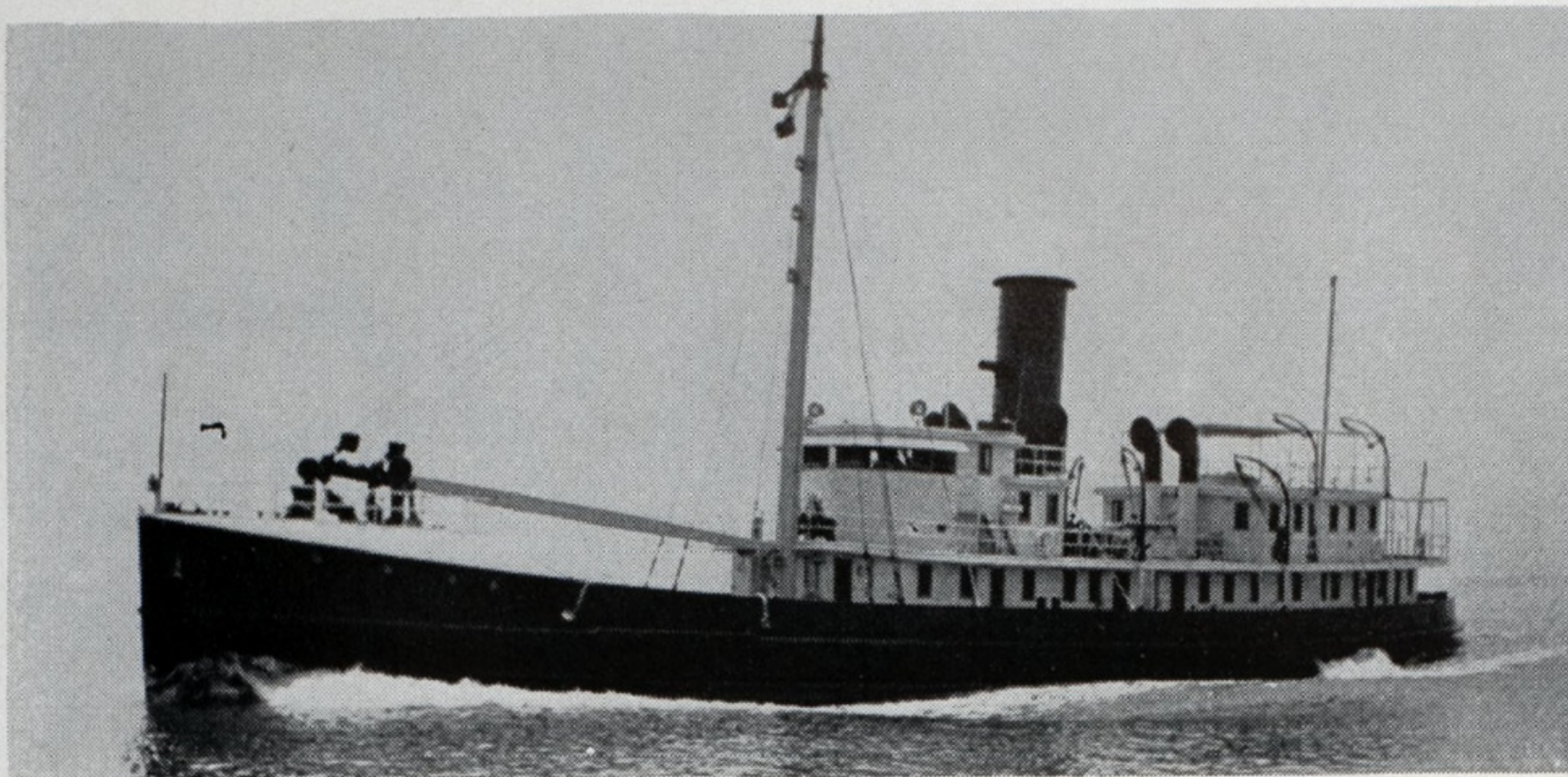
Valves and Fittings—Crane Co.

REMARKS

This large, able, sea-going tug is of electric welded construction throughout. The framing is on the longitudinal system. Four watertight bulkheads divide the hull into five watertight compartments. The Y. T. 119 was built in one of the drydocks at the navy yard, Boston.



ARBUTUS—Lighthouse Tender—Bays—Twin Screw—Steam



DESCRIPTION

Lighthouse tender of steel construction with steel deckhouses. Fitted with a steel mast and boom of 20-tons capacity for handling buoys. Hoisting gear operated through a four drum steam winch located in the forward hold. Propelled by twin screws, steam reciprocating engines, speed 11 knots.

Name—ARBUTUS

Owner—United States Lighthouse Service

Builder—The Pusey & Jones Corp.

Naval Architect—U. S. Lighthouse Service

Launched—Mar. 25, '33; Comp. June 6, '33

Classification—Lighthouse Service

HULL PARTICULARS

Length over all, 174 feet, 7½ inches; length between perpendiculars, 163 feet, 6 inches; breadth molded, 32 feet; depth molded, 14 feet, 6 inches; draft, 10 feet, 7 inches; displacement, at 10 feet, 7 inches draft, 770 tons; cargo capacity, 75 tons, normal; bunker fuel capacity, in tons, 102.5; speed, at sea, 13.7 statute miles per hour.

MACHINERY PARTICULARS

Main Engines—Two, triple expansion, reciprocating steam engines, each of 500 indicated horsepower, at 160 revolutions per minute, built by The Pusey & Jones Corp. Size of engines, 11½ x 19 x 32 inches by 24 inches stroke.

Boilers—Two Foster Wheeler watertube marine boilers with a total heating surface in the two boilers of 5028 square feet; maximum working pressure 225 pounds; fuel, oil, Soot blowers, Diamond Power Specialty Corp. Oil burning equipment, Schutte & Koerting Co.

Auxiliary Generators—Two, General Electric Co.

AUXILIARY EQUIPMENT

Pumps—Schutte & Koerting; M. T. Davidson Co.; and Rumsey Pump Co.

Windlass—Lidgerwood Mfg. Co.

Winch—Lidgerwood Mfg. Co.

Steering Engine—Lidgerwood Mfg. Co.

Refrigeration—Frigidaire Corp.

Plumbing, Valves, Fittings—Crane Co.

Oil Heaters, Strainers—Schutte & Koerting

Thrust Bearings—Kingsbury Machine Works

Indicators, Counters—Alexander McNab

Galley Range—Stamford Foundry Co.

Floor Plates—Central Iron & Steel Co.

Marine Hardware—Dayton Mfg. Co.

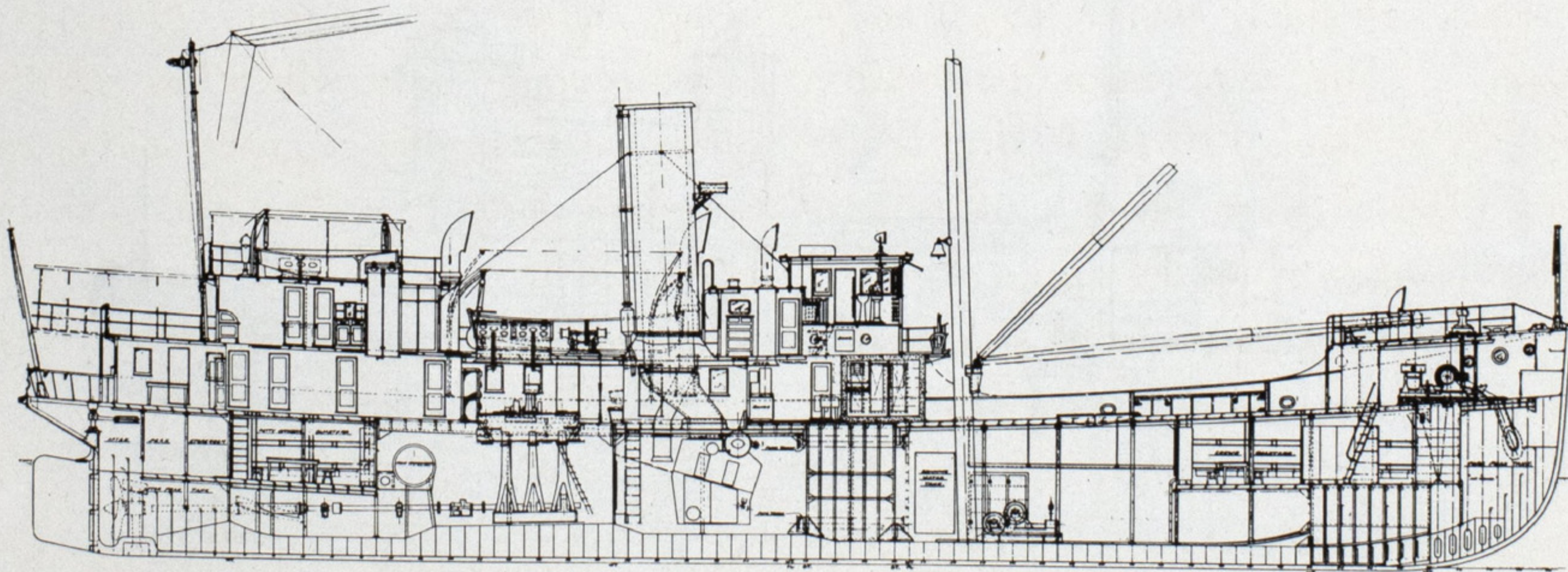
Brass, Copper—The American Brass Co.

Radiators—Chase Brass & Copper Co.

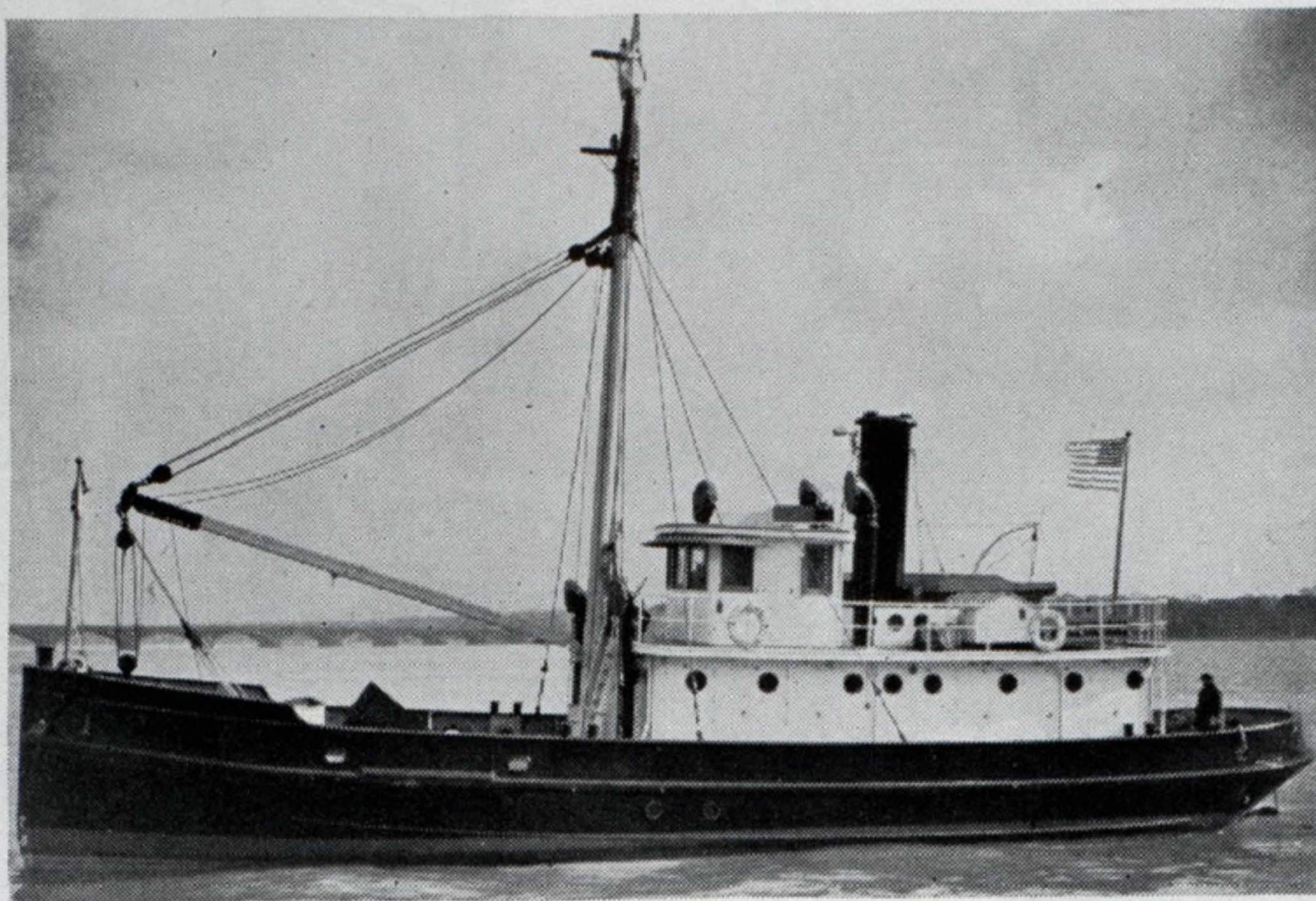
REMARKS

The ARBUTUS, built for the department of commerce, bureau of lighthouses, was assigned to the second lighthouse district, Boston, and replaced the tender AZALEA.

Located in the forward hold is a twin cylinder four-drum, steam hoister, or winch, with steam cylinders 6¼ x 8 inches. The hoister serves as power for the 20-ton 50-foot long boom stepped on the derrick mast located just forward of the superstructure. The boom is used for handling buoys and other equipment necessary for servicing lighthouse and other aids to navigation.



DAHLIA—Lighthouse Tender—Lakes—Single Screw—Diesel



DESCRIPTION

Substantially constructed of steel, the DAHLIA was designed primarily for lighthouse work in the Detroit and St. Clair rivers which accounts for the limited dimensions. She is fully equipped, however, to carry out all of the functions of the usual lighthouse tender. For lifting buoys and other equipment there is installed a 5-ton capacity derrick, with 27-foot steel boom served by an electric winch.

Name—DAHLIA

Owner—United States Lighthouse Service

Builder—Great Lakes Engineering Works

Naval Architect—U. S. Lighthouse Service

Launched—Aug. 26, '33; Comp. Nov. 10, '33

Classification—Lighthouse Service

HULL PARTICULARS

Length overall, 81 feet, 2 inches; length between perpendiculars, 72 feet; breadth molded, 20 feet; depth molded, 9 feet, 6 inches; draft, forward, 6 feet; aft, 7 feet; displacement loaded, 160 tons; gross tonnage, 111; net tonnage, 52; cargo capacity, 5 tons; bunker diesel fuel oil capacity, 5 tons; speed in service, 8 knots.

MACHINERY PARTICULARS

Main Engine—One, four cycle, six cylinder, 10 x 14 inches, diesel engine built by Winton Engine Corp. Engine develops 235 horsepower at 350 revolutions per minute.

Boiler—For heating only. One marine watertube boiler built by the Almy Watertube Boiler Co.; size 77 square feet; oil burning equipment, Ray Engineering Inc.

Auxiliary Generator—One, 15 h.p., 2 cyl., Winton diesel driven generator, 10 k.w.

AUXILIARY EQUIPMENT

Pumps—Nash; Westco; Goulds; Rumsey

Windlass—Lidgerwood Mfg. Co.

Winch—Lidgerwood Mfg. Co.

Steering Gear (Hand)—Lidgerwood Mfg. Co.

Plumbing, Valves, Fittings—Crane Co.

Refrigeration—General Electric Co.

Marine Hardware—The Dayton Mfg. Co.

Stern Bearings—Rubber, B. F. Goodrich Co.

Electric Motors—Diehl Mfg. Co.

Silencers—Engineering Specialties Co.

Fire Extinguishers—Walter Kidde & Co.

Thrust Bearings—Kingsbury Machine Works

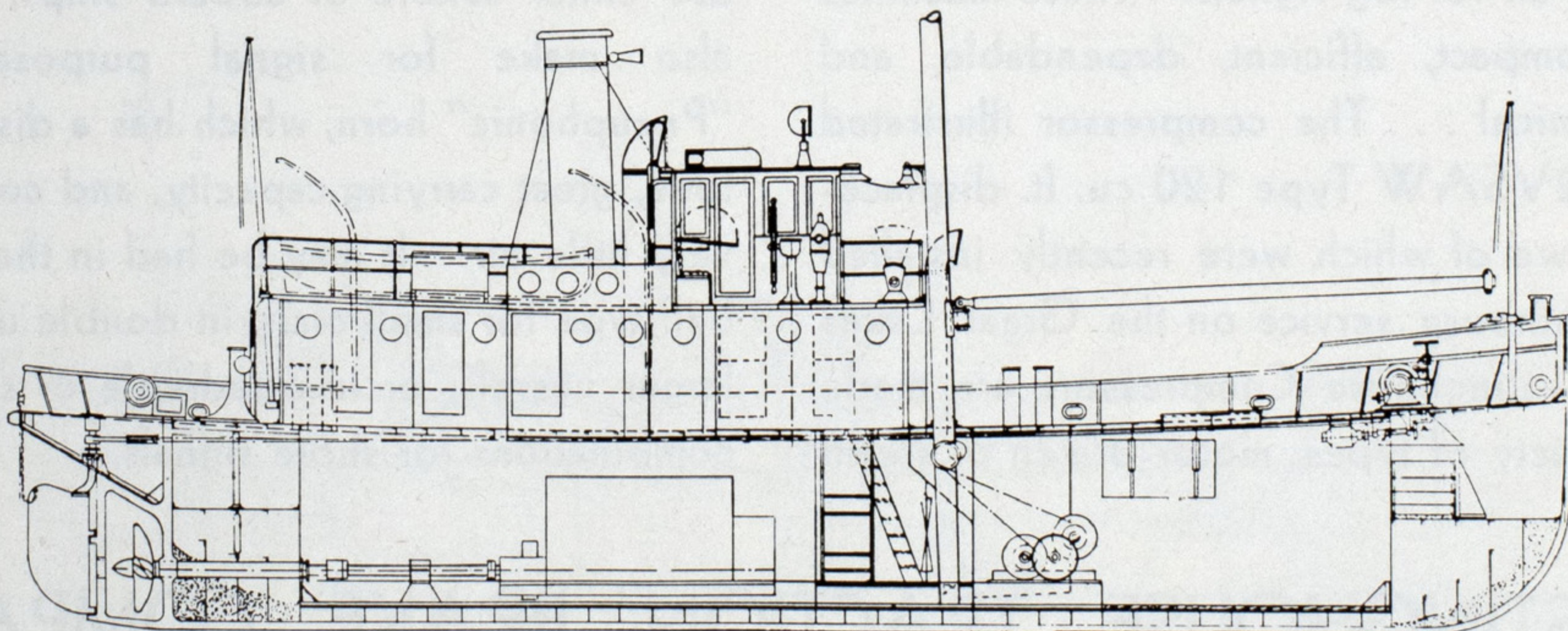
Telegraphs—Chas. J. Henschel & Co. Inc.

Revolution Counters—Alexander McNab

REMARKS

A three-drum electrically driven hoister is located in the after end of the cargo hold with leads passing up through sheaves on the derrick mast under the deck to a five-ton boom, which is stepped on the derrick mast about 6 feet above the deck. The boom has capacity for a five-ton lift.

A steel house on the main deck encloses the living quarters aft for the engineer and captain. Crew quarters are located below.



TIMOTHY B. O'CONNELL—Tanker—Bays—Single Screw—Diesel

DESCRIPTION

Designed for the transfer of oil and gasoline from a bulk plant to various small distributors. Divided into six tanks so that different grades of oil can be carried at the same time. Two pumping units are provided. Speed 9½ miles.



Name—TIMOTHY B. O'CONNELL

Owner—Newport Oil Transportation Co.

Builder—Jakobson & Peterson Inc.

Naval Architect—Thomas D. Bowes, M.E.

Launched—Sept. 28, '33; Comp. Nov. 2, '33

Classification—Owner's requirements

HULL PARTICULARS

Length over all, 98 feet, 6½ inches; length on the load water line, 94 feet; breadth molded, 21 feet, 6 inches; depth molded, 10 feet; draft, 7 feet, 6 inches; displacement loaded, 322.1 tons; gross tonnage, 150; net tonnage, 92.67; cargo capacity, 202 tons, or 64,000 gallons of fuel oil; speed, 9½ statute miles per hour.

MACHINERY PARTICULARS

Main Engine—One, 8-cylinder, 4-cycle, solid injection, diesel engine, 8½-inch bore by 12-inch stroke, built by Winton Engine Corp. Develops 200 brake horsepower at 400 revolutions per minute.

Generators—One Electro-Dynamic, driven from the tail shaft. One auxiliary generator set, 5 k.w., Bromfield diesel-driven Diehl generator.

AUXILIARY EQUIPMENT

Pumps—La Bour, with Hercules gasoline engine drive.

Windlass (Hand)—American Engine Co.

Steering Engine—Carlson & Son.

Propeller—Columbian Bronze Co.

Refrigeration—Leonard Refrigerator

Batteries (Storage)—Philco

Fire Extinguishers—Walter Kidde & Co.

Thrust Bearings—Kingsbury Machine Works

Lifeboat—Welin Davit & Boat Corp.

Galley Range—Elisha Webb & Son Co.

Oil Burner (Heating Boiler)—Ray

Marine Hardware—The Dayton Mfg. Co.

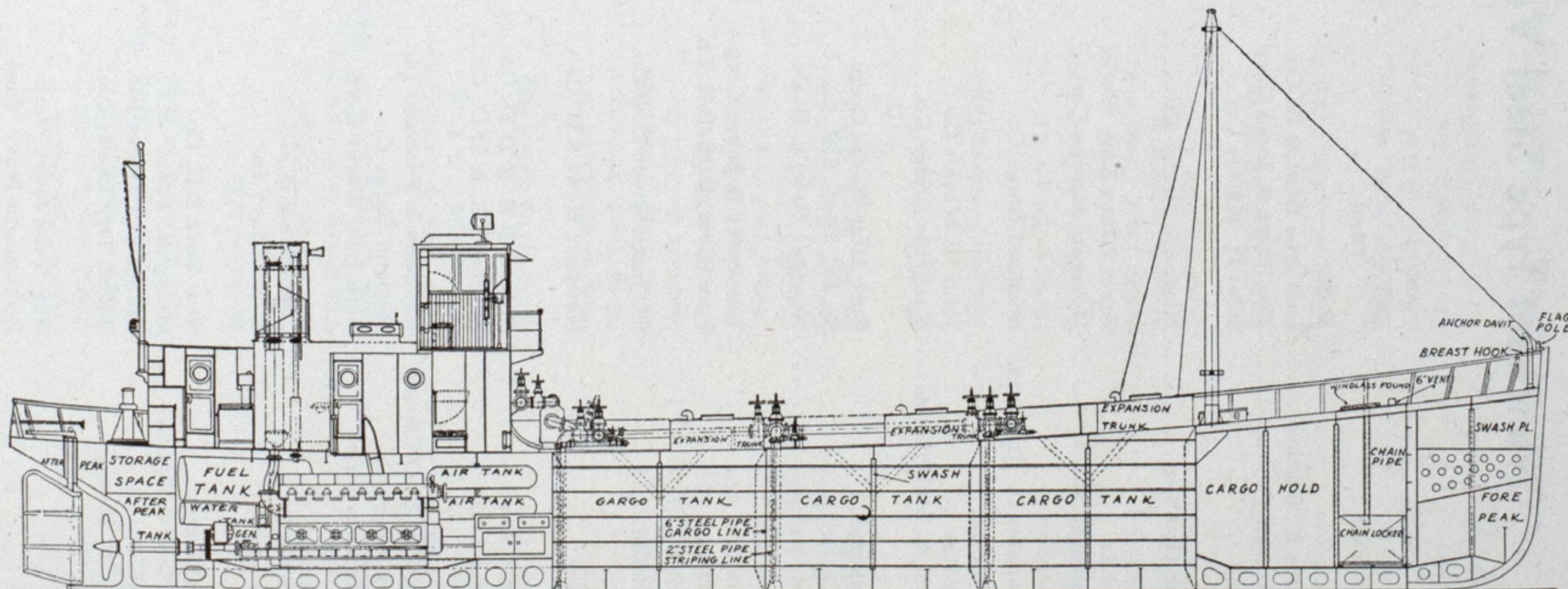
Stern Bearings—Rubber, B. F. Goodrich Co.

REMARKS

Separate pipe lines, two separate pumping units have been provided so that it is possible to discharge two different grades of oil at the same time. These pumps are of the La Bour, centrifugal, self-priming, horizontal type. The capacity at a head of 90 feet is 400 gallons per minute and against a 50 feet head, 700 gallons per minute.

The 2½ kilowatt Electro-Dynamic generator driven from the shaft is used to charge the storage batteries which are located in the trunk of the engine room. Current for driving the electric auxiliaries is taken from the batteries.

This tanker is equipped with bitts making it possible to tow a dumb barge of oil if the requirements of service make it necessary. The vessel is designed especially for harbor and sound operation. Forward there is a cargo hold with hatch and loading boom for carrying barrels and cases of oil and grease. She is of all welded steel construction throughout.



Merchant Type Steel Vessels Over 100 Tons Under Construction in American Shipyards During 1933

Vessels Completed, Alphabetically Arranged

Vessel	Yard	Type	Class	Gross	Owners	Mach.	H.P.	Len. ft. in.	Beam ft. in.	Dep. ft. in.	Fuel	Remarks	Status
Amos K. Gordon.....	Dubuque Boat & B. Co.....	T. Boat	Rivers	695	Standard Oil Co. of La.....	Recip.	500†	Oil	Sternwheel towboat	Completed
Arbutus.....	The Pusey & Jones Corp.....	Tender	Coast	770*	U. S. Bureau Lighthouses...	Recip.	1000	174 6 ½	32	14 6	Oil	Atlantic Coast	Completed
Argo.....	John H. Mathis Co.....	Patrol	Coast	334*	U. S. Coast Guard.....	Oil Eng.	1340	165	25 4	13 3	Oil	Twin Screw Diesel	Completed
Bob Gresham.....	Nashville Bridge Co.....	T. Boat	Rivers	173	W. G. Houglund.....	Oil Eng.	300	131	24	4 6	Oil	River Towing	Completed
Dahlia.....	Great Lakes Eng. Works.....	Tender	Lakes	160*	U. S. Bureau Lighthouses...	Oil Eng.	235	81 2	20	9 6	Oil	Great Lakes Service	Completed
Dolomite No. 1.....	Dolomite Marine Corp.....	Cargo	Canal	1750	Dolomite Marine Corp.....	Oil Elec.	700	213 10	32	13 4	Oil	Barge Canal, Coastwise	Completed
Franklin D. Roosevelt..	Midland Barge Co.....	T. Boat	Rivers	603	Federal Barge Line.....	Oil Eng.	1000	160	40	8	Oil	Twin Screw, River Towboat	Completed
Galatea.....	John H. Mathis Co.....	Patrol	Ocean	334*	U. S. Coast Guard.....	Oil Eng.	1340	165	25 4	13 3	Oil	Twin Screw Diesel	Completed
Geo. A. McWilliams....	Nashville Bridge Co.....	Dredge	Rivers	300	McWilliams Dredging Co...	Oil Eng.	1800	140	36	9	Oil	River Dredging	Completed
Hickory.....	Bath Iron Works Corp.....	Tender	Coast	400*	U. S. Bureau Lighthouses...	Recip.	500	131 4	24 6	11 9	Oil	New York Bay	Completed
Hull No.....	Sp. Pt., Beth. S.B. Co.....	Dredge	Harbor	420	Ellicott Mach. Corp.....	Oil Eng.	1000	134	38	10	Oil	Dredging	Completed
Huntington.....	Newport News S. B. Co.....	Tug	Harbor	271	Newport News S.B. Co.....	Recip.	800	109	28	14 6	Coal	Shipyards Service	Completed
Lilac.....	The Pusey & Jones Corp.....	Tender	Coast	770*	U. S. Bureau Lighthouses...	Recip.	1000	170	32	13	Oil	Delaware Bay, River	Completed
Lurline.....	Fore River, Beth. S.B. Co.....	Pass.	Ocean	18021	Matson-Oceanic S.S. Co....	Turbine	22000	631 6	79	52 9	Oil	California-Hawaii	Completed
Orlando.....	St. Johns River Line Co.....	Cargo	Coast	454	St. Johns River Line Co....	Oil Eng.	250	140	27 11	8 2 ½	Oil	Harbor, River Service	Completed
Peten.....	Newport News S.B. Co.....	Pass.	Ocean	7000	United Mail S.S. Co.....	Turb. Elec.	10500	446 9	60	34 9	Oil	United Fruit Co.	Completed
Santa Elena.....	Federal S.B. & D.D. Co.....	Pass.	Ocean	11200	Grace Steamship Lines.....	Turbine	12000	508	72	39	Oil	N. Y. -Cent. Amer. & W. Coast	Completed
Santa Lucia.....	Federal S.B. & D.D. Co.....	Pass.	Ocean	11200	Grace Steamship Lines.....	Turbine	12000	508	72	39	Oil	N. Y. -Cent. Amer. & W. Coast	Completed
Timothy B. O'Connell..	Jakobson & Peterson Inc....	Tanker	Coast	150	Newport Oil Transp. Co....	Oil Eng.	180	98 6 ½	21 6	10	Oil	New England Ports	Completed
Tom Sawyer.....	Midland Barge Co.....	T. Boat	Rivers	603	Federal Barge Line.....	Oil Eng.	1000	160	40	8	Oil	Twin Screw, River Towboat	Completed
Turecamo Girls.....	Bath Iron Works Corp.....	Tug	Harbor	148	B. Turecamo Towing Corp...	Oil Eng.	725	93	23	11	Oil	Towing, N. Y. Harbor	Completed
Unknown.....	Canulette S.B. Co.....	T. Boat	Harbor	150	La.-Tex. Waterways Corp..	Oil Eng.	750	100	24	8	Oil	Twin Screw, Shallow Draft	Completed
Unknown.....	B. H. Elliott Inc.....	Ferry	Harbor	350†	Harris County, Texas.....	Oil Eng.	150	94	38	9	Oil	Houston Ship Channel	Completed
Washington.....	New York S.B. Co.....	Pass.	Ocean	24289	U. S. Lines Inc.....	Turbine	30000	705 3	86	47	Oil	N. Y. to Channel Ports	Completed
William T. Warner.....	Memphis, Tenn.....	T. Boat	Rivers	104	Wolf River Transp. Co....	Oil Eng.	600	99 6	17	7	Oil	Diesel, Screw Propulsion	Completed
Wistaria.....	United Dry Docks Inc.....	Tender	Coast	323*	U. S. Bureau Lighthouses...	Oil Elec.	240	121 4	25	9	Oil	Chesapeake Bay	Completed
Wm. F. Kenny.....	United Dry Docks Inc.....	Cargo	Coast	1000	N. J. Clay Products Co....	Oil Eng.	700	185	43	19	Oil	Twin Screw Diesel	Completed
YF 221.....	New York Navy Yard.....	Lighter	Harbor	250**	United States Navy.....	Oil Eng.	360	120	30	12 3	Oil	Freight Lighterage	Completed
YG 17.....	Portsmouth Navy Yard.....	Lighter	Harbor	302*	United States Navy.....	Oil Eng.	180	118 3	26	12 9	Oil	Garbage Lighter	Completed
YG 18.....	Pearl Harbor Navy Yard.....	Lighter	Harbor	302*	United States Navy.....	Oil Eng.	180	118 3	26	12 9	Oil	Garbage Lighter	Completed
YSD 9.....	Pearl Harbor Navy Yard.....	Derrick	Harbor	350*	United States Navy.....	Oil Eng.	360	104	30	7	Oil	Seaplane Wrecking Derrick	Completed
YT 119.....	Boston Navy Yard.....	Tug	Harbor	340*	United States Navy.....	Oil Elec.	600	110 6	24	13 6	Oil	For Towing Service	Completed

Vessels Under Construction as of December 31, 1933, Alphabetically Arranged

Alabama	Ingalls Iron Works	Dredge	Rivers	1093	McWilliams Dredging Co.	Recip.	1200*	140	49	9	Oil	Non-self-propelled	Under con.
Algonquin	The Pusey & Jones Corp.	Cutter	Coast	1000*	U. S. Coast Guard	Turbine	1500	165	36	21	Oil	Coastwise Service	Under con.
Angelina	Newport News S.B. Co.	Cargo	Ocean	5200	A. H. Bull Steamship Co.	Turbine	3150	408	54	30 6	Oil	Speed, 13 knots	Under con.
Ariadne	Lake Union D.D. & M. Wks.	Patrol	Coast	334*	U. S. Coast Guard	Oil Eng.	1340	165	25 3	13 2	Oil	Twin Screw Diesel, Patrol B.	Under con.
Atalanta	Lake Union D.D. & M. Wks.	Patrol	Coast	334*	U. S. Coast Guard	Oil Eng.	1340	165	25 3	13 2	Oil	Twin Screw Diesel, Patrol B.	Under con.
Burgess	Marietta Mfg. Co.	Dredge	Rivers	1502	U. S. Engineers, Memphis	Recip.	2000	244	52	9	Oil	River Dredging	Under con.
Calumet	Navy Yard, Charleston	Cutter	Harbor	290*	U. S. Coast Guard	Oil Elec.	800	110 6	24	12 7	Oil	Coast Guard Harbor Service	Under con.
Comanche	The Pusey & Jones Corp.	Cutter	Coast	1000*	U. S. Coast Guard	Turbine	1500	165	36	21	Oil	Coastwise Service	Under con.
Cyane	Lake Union D.D. & M. Wks.	Patrol	Coast	334*	U. S. Coast Guard	Oil Eng.	1340	165	25 3	13 2	Oil	Twin Screw Diesel, Patrol B.	Under con.
Del-Mar-Va	The Pusey & Jones Corp.	Ferry	Bays	1497	Virginia Ferry Corp.	Recip.	3000	260	59	19 1	Oil	Auto and Passenger Ferry	Under con.
Dione	Manitowoc S.B. Corp.	Patrol	Coast	334*	U. S. Coast Guard	Oil Eng.	1340	165	25 3	13 2	Oil	Twin Screw Diesel, Patrol B.	Under con.
Electra	Manitowoc S.B. Corp.	Patrol	Coast	334*	U. S. Coast Guard	Oil Eng.	1340	165	25 3	13 2	Oil	Twin Screw Diesel, Patrol B.	Under con.
Hemlock	Berg Shipbuilding Co.	Tender	Coast	770*	U. S. Bureau Lighthouses	Recip.	1000	174 6	32	14 6	Oil	Alaska Coast	Under con.
Hudson	Navy Yard, Portsmouth	Cutter	Harbor	290*	U. S. Coast Guard	Oil Elec.	800	110 6	24	12 7	Oil	Coast Guard Harbor Service	Under con.
Hull No. 150	Lake Wash. Shipyards	Pass.	Coast	1900	Northland Transp. Co.	Oil Eng.	2000	220 10	40 6	23 1 1/2	Oil	Northwest, to Alaska	Under con.
Hull No. 150	Sun S.B. & D.D. Co.	Tanker	Bays	600	Atlantic Refining Co.	Oil Elec.	500	201 2	34	12	Oil	Barge Canal, Coastwise	Under con.
Hull No. 414	New York S. B. Co.	Tanker	Ocean	9100	Standard Vac. Transp. Co.	Turbine	4000	500	65 9	37	Oil	Tanker, Ocean Service	Ordered
Hull No. 415	New York S.B. Co.	Tanker	Ocean	9100	Standard Vac. Transp. Co.	Turbine	4000	500	65 9	37	Oil	Tanker, Ocean Service	Ordered
Hull No. 822	United Dry Docks Inc.	Tanker	Coast	1200	Standard Vac. Transp. Co.	Oil Eng.	800	260	40	14	Oil	Coastwise Service	Under con.
Hull No. 823	United Dry Docks Inc.	Tanker	Coast	1200	Standard Vac. Transp. Co.	Oil Eng.	800	260	40	14	Oil	Coastwise Service	Under con.
Hull No. 824	United Dry Docks Inc.	Tanker	Coast	1200	Standard Vac. Transp. Co.	Oil Eng.	800	260	40	14	Oil	Coastwise Service	Under con.
Hull No.	Sp. Pt., Beth. S.B. Co.	Tanker	Coast	1200	Gulf Refining Co.	Oil Eng.	800	247	40	14 6	Oil	Coastwise, Barge Canal	Under con.
Jadwin	Marietta Mfg. Co.	Dredge	Rivers	1502	U. S. Engineers, Memphis	Recip.	2000	244	52	9	Oil	River Dredging	Under con.
Luzitania	Electric Welding Co.	Tanker	Harbor	270	Luzo Petrol. Transp. Co.	Oil Eng.	280	116 6	26	10 6	Oil	Harbors, Bays, Coastwise	Under con.
Manuela	Newport News S.B. Co.	Cargo	Ocean	5200	A. H. Bull Steamship Co.	Turbine	3150	408	54	30 6	Oil	Speed, 13 knots	Under con.
Mohawk	The Pusey & Jones Corp.	Cutter	Coast	1000*	U. S. Coast Guard	Turbine	1500	165	36	21	Oil	Coastwise Service	Under con.
Navesink	Navy Yard, Charleston	Cutter	Harbor	290*	U. S. Coast Guard	Oil Elec.	800	110 6	24	12 7	Oil	Coast Guard Harbor Service	Under con.
Nemesis	Marietta Mfg. Co.	Patrol	Coast	334*	U. S. Coast Guard	Oil Eng.	1340	165	25 3	13 2	Oil	Twin Screw Diesel, Patrol B.	Under con.
Nike	Marietta Mfg. Co.	Patrol	Coast	334*	U. S. Coast Guard	Oil Eng.	1340	165	25 3	13 2	Oil	Twin Screw Diesel, Patrol B.	Under con.
Onondaga	Defoe B. & M. Works	Cutter	Coast	1000*	U. S. Coast Guard	Turbine	1500	165	36	21	Oil	Lakes or Coastwise	Under con.
Pandora	Manitowoc S.B. Corp.	Patrol	Coast	334*	U. S. Coast Guard	Oil Eng.	1340	165	25 3	13 2	Oil	Twin Screw Diesel, Patrol B.	Under con.
Tahoma	Defoe B. & M. Works	Cutter	Coast	1000*	U. S. Coast Guard	Turbine	1500	165	36	21	Oil	Lakes or Coastwise	Under con.
Tamarack	Manitowoc S.B. Corp.	Tender	Lakes	400*	U. S. Bureau Lighthouses	Oil Elec.	450	124 2 3/4	29	10	Oil	Great Lakes	Under con.
Triton	Marietta Mfg. Co.	Patrol	Coast	334*	U. S. Coast Guard	Oil Eng.	1340	165	25 3	13 2	Oil	Twin Screw Diesel, Patrol B.	Under con.
Tuckahoe	Navy Yard, Charleston	Cutter	Harbor	290*	U. S. Coast Guard	Oil Elec.	800	110 6	24	12 7	Oil	Coast Guard Harbor Service	Under con.

*Displacement Tonnage. **Capacity in Tons. †Estimated.

Need Government Support to Meet Competition

P. A. S. Franklin, president of the International Mercantile Marine Co., who has returned from a business visit to England on the White Star liner MAJESTIC March 14 made the following statement:

The British government, the Cunard line, and the White Star line have concluded an arrangement under which the two companies are to be merged, and the British government will advance to the merged companies the sum of £9,500,000 for the completion of the new Cunard steamer No. 534, for working capital and for possible additional steamers, thus forming a powerful British national line to compete with American flag steamers in the North Atlantic.

In coming to the arrangement for the merger of the two lines, the Marine company is convinced that its rights in connection with the shares of the Oceanic company have been grossly violated, and we have instructed our lawyers in England to apply to the courts for an injunction to restrain the Oceanic company, the Cunard company and others involved from proceeding with the merger.

The I. M. M. company holds all the shares of the Oceanic company as security for the balance of approximately £2,350,000 still due for the sale of the White Star line.

Americans Not Consulted

Without consulting us and without any meeting of the shareholders, the directors of the Oceanic company entered into an agreement on Dec. 30 last with the British government and the Cunard company. We were not advised regarding all the details of this agreement until Feb. 7, 1934, after being announced in the press. Our consent to the terms of the merger, which are very unfair to the Oceanic company and very beneficial to the Cunard company, was then asked, and we declined to give it.

The Oceanic company directors have now informed us that they propose carrying out the merger without the approval of their shareholders.

We do not wish to be even remotely interested in a British national line, as our desire is to develop under the American flag exclusively.

It is perfectly obvious that the new merger is nothing more or less than a British national line, backed by the British treasury to the extent of about \$50,000,000. If we are to keep our American ships on the North Atlantic, and upbuild and develop our position in this vital trade route with new ships, we must have the full financial support and co-operation of the United States govern-

ment, just as our competitors will receive such help from the British government.

If the American merchant marine is to compete on equal terms with those of Great Britain, France, Germany, Italy and the other great powers, it must have substantial help—I prefer to call it "protection"—from our government. Consequently, you may readily realize how gratifying it was for me to learn of the President's attitude revealed in a statement issued March 13, in which he wisely favored definite assistance offering real encouragement to all those, who, like myself, have been working for years to establish our merchant marine on a plane where it can compete with foreign ships on a basis of equality.

Want Only American Ships

It is a matter of record that for years the I. M. M. has been striving to rid itself of all ships operating under other than the American flag. As a consequence of my negotiations abroad I feel justified in predicting that within a short period the I. M. M. will attain its long cherished ambition to operate American flag ships only.

A tremendous interest is manifest abroad in the efforts of President Roosevelt to overcome the depression. They realize that their own economic destiny is linked with ours, and that the quicker we get back to normal the sooner will they see a return to better times in their own respective countries. Naturally this restoration to prosperity will be of benefit to the shipping industry, which is taking a much more optimistic view of the future today than it did on the occasion of my last trip abroad.

All the large nations are building up their merchant marines, and I regret to say are outstripping the United States in this respect, in preparing for the return of prosperity. We should be building ships of the WASHINGTON and MANHATTAN type right now. Our company is prepared to go ahead with the construction of such transatlantic liners and new ships for other important trade routes as soon as the government signifies its willingness to aid and protect us. Preliminary plans for new steamers have already been drawn and await approval.

Efficient Ships Needed

If America is to get her share of the world's passenger and freight business when the upward swing comes, she should have ships capable of competing with our foreign neighbors. Lacking these, she will be terrifically handicapped in the post-depression race to capture the world's markets.

Weldability of Ship Steel Investigated by Navy

The navy department has for some time been conducting investigations to determine what changes in the chemical compositions of various steels will be necessary, as well as practicable, in the interest of obtaining weldability. With the extension of the application of arc welding to larger proportions of the structure of warships, it has become imperative to obtain steel in each of the various classes that will lend itself to welding attachment without the loss of any necessary physical characteristic forming the basis upon which the particular steel is employed, and without introducing, as a result of the welding, unacceptable local hardness, with consequent brittleness.

As is generally known to the steel trade, these investigations have pointed to the necessity of establishing limits upon carbon, manganese and silicon contents, in addition to the long-established restrictions on sulphur and phosphorus. If these limits are set too high, the supposedly "medium steel" will practically correspond in chemical analysis to material now stocked by the navy yards as "high tensile steel" and may be expected to approach the behavior of these steels in its reaction to welding. If the limits are set too low, substantial price increases may result and competition may be unduly restricted.

As regards high tensile steel, the navy department is understood to consider manganese-vanadium steel the most satisfactory yet tested, but to be investigating other steels as specimens are made available to it for test.

As regards corrosion resisting steel, the department has definitely concluded to specify a maximum carbon of 0.10 for both rolled products and castings, in order to keep within acceptable limits the carbide precipitation after welding and the resultant tendency to intergranular corrosion.

The present attitude of the navy department is one of careful investigation, based on needs of the service and the possibilities of obtaining steels of the desired compositions from the manufacturers. Navy officers concerned in the work are free in commending the helpful attitude taken generally by the steel producers and confidently expect to obtain results, with their help, that will be satisfactory both to the navy and to the trade.

The United States engineers recently awarded a contract to the Cutler-Hammer Co., at a bid price of \$4081, for furnishing two electrically operated watertight bulkhead doors complete with operating mechanism and signal system for the United States dredge A. MACKENZIE.

America's Maritime Sweepstakes

Thirty Foreign Nations Participate

By R. J. Baker*

THE ocean transportation business of the United States is the most coveted commercial prize on earth, for American waterborne commerce reached the stupendous figure of one billion dollars in a year. Thirty maritime nations raced for a share of this business, the world's greatest commercial prize. The best we, the creators of this commerce have been able to retain, has been about one third. All of the balance was carried in foreign flag vessels, and still is.

Within the memory of some people now living, Yankee clippers carried better than 80 per cent of our overseas trade and a substantial part of the trade of other countries. At the outbreak of the World war we were carrying less than 10 per cent of it—and actually had but 17 vessels engaged in foreign trade.

For more than a year the organization which I have the honor of serving as president has sought to awaken a renewed interest in all that pertains to the construction and operation of ships, for it is a vital issue of the hour and one that is of the utmost concern to every industrialist, agriculturist and banker in the country. If proof were needed to support this statement I have only to call your attention to the things accomplished in the past five years since the signing of the Jones-White bill.

Owners Invest \$78,000,000

While only 42 new vessels have been built, instead of the 60 provided for in the bill, these vessels, together with the 40 that were reconditioned, have given employment to more than 40,000 people in the shipyards and plants supplying the equipment. It put approximately two hundred million dollars into labor and material that would have otherwise remained idle, and out of this vast amount fully 80 per cent represents money paid for labor in the yards and factories. This was not all government loans. The shipping companies have invested 39 per cent of the total amount expended since 1928, which includes their initial payment of one fourth of the construction costs and the repayments on principal that have been made. Truly the shipping industry

has done its part to aid industrial recovery.

You have had ample evidence of that truth in the work provided for the New England yards. Some of the finest vessels in our modern merchant fleet have left the ways in your plants and the gainful employment provided for your mechanics and artisans in this industry has all tended to put New England among the sectional leaders to break through the fog of national depression. New England has been doubly fortunate in that it continued to enjoy a very substantial share of the equipment purchased for ships built in other than New England yards.

It has long been recognized that the American standards of wages and living both in construction ashore and in the operation of vessels at sea, are the highest of any nation in the world. No one would dare suggest that those standards be lowered even though they be two and three times the costs of like service and material in competitive countries. This is the situation that has made federal assistance necessary. The differential in construction and operation costs had to be absorbed if the American merchant marine was to be saved.

Effectiveness of Shipping Act

The merchant marine act has accomplished the purposes for which it was intended: "that it is necessary for the national defense and for the proper growth of its foreign and domestic commerce that the United States shall have a merchant marine of the best equipped and most suitable type of vessels sufficient to carry the greater portion of its commerce and serve as a naval or a military auxiliary in time of war or national emergency."

This is clearly indicated in the recent report of Postmaster General Farley who stated: "The total number of routes (foreign trade) under contract on June 30 was 44. Twenty-four of these routes were established and formerly operated by the shipping board. They are now being operated by private operators under mail contracts with a considerable saving to the government." Continuing, the postmaster general states: "It is desired to emphasize the fact that the carrying of the mails is a minor or incidental purpose of these contracts. The development and

maintenance of an American merchant marine of the best equipped and most suitable type of vessels, sufficient to carry the greater part of the country's commerce and to serve as a naval auxiliary in time of national emergency—with the construction of vessels in American shipyards, by American labor from materials produced in this country, the employment of a large number of American seamen, and the retention of enormous sums paid as freight to American instead of foreign companies—are the principal objects of these contracts." Who could have made a fairer presentation for the shipping interests than this coming from the postmaster general whom many considered apathetic to the development of an American merchant marine?

The President's Program

It has been a source of much satisfaction to have enjoyed the co-operation of the financial and legislative interests of the country in the five year struggle to re-establish the merchant marine. Further encouragement has been found in the constructive attitude of President Roosevelt and his expressed intention to inaugurate a program that will insure such government support as may be necessary to make this country once more a factor in ocean transportation.

The United States is noting each move on the part of competitive countries who seem bent upon economic isolation. Unfortunately, the very policy that makes maritime independence so necessary at the same time tends to reduce available revenue. This is where we stand at present, needing ships to be self-contained yet needing cargo to support the ships. There is only one answer to this apparent impasse of the seas. That is the fact that we, as a nation, create enough business to support a merchant fleet at least twice the size of the present establishment. There does not appear to be any logical reason why we should not ask that the American people support their own merchant marine. The substantial step taken in its restoration represents a per capita outlay of only 17 cents and in return for the expenditure employment has been provided for some hundreds of thousands afloat and ashore and millions have been kept in this country that would otherwise have been spent abroad.

*From an address by R. J. Baker, president of the American Steamship Owner's Association, at a dinner of the Propeller Club of the Port of Boston, held at the Hotel Essex, Boston, on March 22.

Welded Clam Shell Dredge for Levee Construction

THE INGALLS IRON WORKS CO now has under construction at its Chickasaw yard Mobile county, Ala., an all welded, non self propelled, steam powered, $7\frac{1}{2}$ cubic yards, clam shell dredge for the McWilliams Dredging Co., Chicago. This dredge, which is named the Alabama, is 140 feet in length over all;; breadth molded, main hull, 49 feet; breadth including pontoons, 65 feet 3 inches; depth molded, 9 feet; draft, mean, 4 feet 10 inches; displacement loaded, 1200 tons; and bunker fuel oil capacity 120 tons.

For supplying steam to the winding engines, pumps, steam engine driven generators and other auxiliaries there are two Johnson, locomotive type, fire tube, oil burning boilers of 135 horsepower each. The oil burning equipment was supplied by the Coen Co. The two electric generators are of Engberg type supplied by the Troy Engine & Machine Co. The winding engines were supplied by the Marion Steam Shovel Co. and Bucyrus Erie Co... Pumps are of Gardner make.

For Levee Construction

This dredge which incorporates a number of unique features, referred to below, was designed for levee construction on the Mississippi river and its tributaries. Its long boom (210 feet) is necessary to place the material in the levee without rehandling, the dredge being held away from the levee by the usual 100-foot beam.

The following description of the dredge Alabama, pointing out the unusual features of design, was prepared by Wilbur F. Powers, naval architect and engineer, the McWilliams Dredging Co.:

Unique Features of Design

In building this dredge, the McWilliams Dredging Co. has endeavored to improve upon other clam shell equipment, and has made a few departures from its 5 cubic yard clam shell dredge Texas, built three years ago.

In the first place, the hull was made 49 feet molded beam, or just wide enough to install the 36-inch square steel spuds, within the side of the hull, but outside the deck house. The spuds being 70 feet long, the spud wells were cut in the side plating, and the spuds arranged to be held with six cast steel gates. These gates allowing the spuds to be shipped without lifting the spuds above the deck.

To get the necessary breadth of hull, to give the required transverse stability, to handle the long steel

boom, pontoons 140 feet long, 8 feet wide, and 7 feet 6 inches deep, arranged for bolting to the main hull, on each side, are provided. These pontoons are designed so that they may both be attached on the same side, if desired, to move the center line of the boom closer to the bank, and thereby increase the outreach. This gives a very flexible arrangement, allowing the dredge to be taken up narrow channels, or operate with a shorter boom without using the pontoons.

The second departure from previous experience was in the adoption of a steel boom. This boom is made of a 30-inch x 15-inch x 180-pound eye boom and is 210 feet long. It is made of three pieces, the lower, butt end, being 104 feet, then a 26-foot removable section, so that the boom may be shortened, and an 80-foot end, carrying the boom paint sheaves. The eye beam section was adopted, to give flexibility to the steel boom, and avoid if possible, failure by crystallizing of the steel, from flexure, which takes place every time a load is picked up or dropped, due to the weight of the wire rope in the ten part topping lift.

All Welded Throughout

The third and major departure was in the construction of the dredge itself, which is a 100 per cent welded job. No rivets being used in either the hull or superstructure and only a few fitted bolts in the A frame connections.

In designing the hull, angle bars and flanged plates were used with the toe of the angle welded continuously to the plates, the plating is either lapped or strapped and welded continuously, both inside and outside, so that nowhere in the hull are there any faying surfaces which are not completely welded all around to prevent rust from forming between them.

The superstructure was designed to give a pleasing appearance, by making a panel effect, using tee bars at the plate joints, and doing all welding on the inside of the structure, so that all sight edges would be sharp and true, and not marred by welding.

Boom Swings 180 Degrees

The swinging arrangement is designed to allow the boom to swing a full 180 degrees. This is accomplished by using wide grooved sheaves, mounted on an overhead table, carried on cantilevers. This was first worked out in the design of the

dredge Texas by the writer, and with that experience, the company rebuilt its 4 cubic yards dredge Louisiana, to operate in this way. To handle the longer and heavier boom, and loads on the present dredge, the design has been enlarged and improved.

The hoisting and swinging cables on this dredge are of $1\frac{3}{8}$ -inch wire rope, with a breaking strength of 157,000 pounds. As the winding engines have sufficient power to break these cables, the boom is designed to take this load with a maximum stress, in compression, of 13,334 pounds, with a radius of gyration of 90, and boom rigging with a factor of safety of 3 or more. The working load, taken as 25,000 pounds for the bucket and nine cubic yards of earth at 28,000 pounds, a total of 53,000 pounds, gives a compressive stress in the boom of 5200 pounds and a factor of safety in the rigging of 8 or more.

Mississippi River Cruise

The enterprising Baltimore & Ohio railroad, announcing a thirteen-day Mississippi river cruise on the famous packet steamer CAPE GIRARDEAU, deftly takes advantage of the American craze for cruises.

Leaving New York by special train on March 31 and stopping briefly at Washington, the party, which is limited to 100, arrives in Louisville, Ky. Easter Sunday morning; then on to Memphis, Tenn., where they will embark on their "cruise ship" in the evening for the leisurely trip down the river.

First stop, April 2 is at Natchez, the great cotton center and on the second day thereafter they will arrive at New Orleans for two days of sightseeing and entertainment. On the return voyage, stops will be made at Baton Rouge, Natchez, Vicksburg, Greenville and Memphis, where passengers re-entrain.

If this is not the first long cruise of the kind promoted by an American railroad, it is at least the first ambitious revival in many years, and a full passenger list is anticipated.

Terminal at Cartagena

The new Colombian liner HAITI, which recently left New York for Haiti, Jamaica, Colombia and Panama, was one of the first vessels to dock at the newly completed \$1,000,000 terminal at Cartagena, Colombia, and in the future all vessels owned by the company will now dock at and sail from the new pier.

The new terminal at Cartagena is one of the most modern in the world and is particularly well equipped with facilities for passengers and cargo. The harbor of Cartagena has also been greatly improved

Successful Performance of Arcform Vessel

The second of the "arcform," Isherwood design, economical cargo carriers, the ARCTEES has been completed by the Furness Shipbuilding Co. Ltd., England. Her first voyage called for a cargo of about 6000 tons of coal from England to Italy. It is understood that loaded trials were carried out with this cargo on board, before she began her maiden voyage.

The first vessel of the type, the ARCGOW, recently completed a successful maiden voyage with coal from England to Buenos Aires. It is understood that she averaged a speed of 10.62 knots on a coal consumption of 19.44 tons per 24 hours. When leaving on her voyage she had a total deadweight, including stores, of 6850 tons.

The ARCGOW, the third of this type, was launched at Lithgow's yard, Port Glasgow, on March 20. It is understood that Sir Joseph Isherwood is planning to build nine more vessels of the same type after the completion of the ARCGOW.

In view of the wide interest on the part of marine men everywhere in the performance of the "arcform" type of vessel, there is quoted below a letter, sent from Buenos Aires, Feb. 16, by Capt. E. R. Howe of the ARCGOW to Sir Joseph Isherwood & Co. Ltd. The voyage of the ARCGOW to Buenos Aires, with coal, commenced at Plymouth, England, on Jan. 22. The captain's letter follows:

"We arrived at Recalada, pilot station at 9 p. m., Feb. 14, the total steaming time from Immingham being 24 days, 23 hours, 16 minutes, a total distance of 6364 miles, giving an average speed of 10.62 knots on a consumption of 19.44 tons. Weather conditions were not good for a fast run. Strong head winds and high seas during the first six days gave us a big handicap to overcome, and, while winds were moderate over the remaining part of the passage, a continuous beam swell was experienced during the whole time which naturally affected the speed.

Ship Behaves Splendidly

"No favorable current was found in the South Atlantic, and an adverse current was experienced from Ushant to St. Vincent totaling about 4555 miles in all. I have confirmed this by wireless and verbally from several masters coming down at the same time. The ship behaved splendidly in a heavy head sea during a fresh gale on Jan. 26-27. Her lowest speed during the worst of it was about 6.5 knots, and as the revolutions were never below 57, it left no doubt as to her ability to drive into a head sea. Naturally she shipped considerable water, but comparing her performance with other ships I have commanded, she

came out with flying colors.

"She most decidedly does extremely well in a head sea, and any ordinary loaded ship would have been eased down by 20 revolutions.

"With at times a very high beam swell the roll was never excessive and always quite easy, comparing quite well with my experience of other ships under similar conditions.

"It is quite well known that the Brazil current is at its weakest in February, and is often nonexistent. Therefore, the last eighteen days is a good example of what the ship can do, showing an average speed of 11.1 knots. Only three of these days were really smooth, and on several days quite a big swell was running.

"I must stress the very excellent way in which the ship goes into a head sea. It is most certainly a great point in favor of arcform and there is not the slightest doubt in my mind as to its being a great success. The machinery worked smoothly and well throughout the passage. No hitch whatever developed and a nonstop run was made."

Cunard-White Star Merger

Should the proposed merger of the Cunard and White Star in the transatlantic service be affected because of legal action by P. A. S. Franklin, president of the International Mercantile Marine Corp. in the interests of that company in the Oceanic Steam Navigation Co. (White Star line), the British government's attitude is that the same ends can be secured by other means. According to the New York Herald Tribune, Neville Chamberlain, British chancellor of the exchequer in a statement March 15 in the house of commons said: "The board of the Oceanic Steam Navigation Co. has been advised that they may legally implement their part in the merger scheme without the consent of the American company.

"I wish, however, to make it plain that if a contrary decision emerges as a result of legal action the parties can attain by alternative methods, which could not be opened to attack, precisely the result contemplated by the merger company and such methods would be within the scope of the North Atlantic shipping bill in its present form.

"In the circumstances, I have satisfied myself that no reason exists as to why the house should be deflected from its purpose by any action which may be taken by the International Mercantile Marine Co."

Lord Essendon, White Star chairman, is reported having said that the arrangements for the merger are going ahead. Sir Percy Bates, chairman of the Cunard line, is also reported as of the opinion that no legal action by the International Mercantile Marine can possibly affect the merger.

Shipping Code Approval Is Still Held Up

In the March Marine Review approval of the final draft of a master code for the shipping industry was said to be imminent. But as this is written the master code has not yet been approved. Failure of approval is due to the complications feared by foreign lines. On March 27, Deputy Administrator Weaver declared the code satisfactory to labor and operators and that it would probably be submitted to General Johnson by April 1.

It is believed, however, that the foreign shippers are coming to the point of co-operating with the American companies on a reasonable rate stabilization. The attitude of the American shipowners' association is that unless this important feature is incorporated in the code there would be no excuse for setting up the elaborate machinery necessary for its operation. If the code is to deal only with labor conditions, it would not be necessary to do much more than come to an agreement on conditions for labor and then to see that they are fairly carried out.

From the American steamship owners' point of view, it would be better for the steamship companies, foreign as well as American, to enter into an agreement under a code under which all of the lines would have a proportionate voice in the control of rates, rather than to invite government regulation. The power to exercise government regulation, it is believed, now exists under section 19 of the merchant marine act of 1920.

The American Steamship Owners' association recently adopted a resolution in favor of a general shipping code only on the condition that effective stabilization be included in its provisions, and that such stabilization will be effected by the industry itself with proper government supervision and approval. The purpose of such stabilization is not to raise rates or to increase the burden of shippers. It is intended instead to do away with unfair competitive practices and rate cutting which in the long run can only harm the shipper as well as the carrier.

Pending approval of the master code, the various divisional codes, have generally been prepared, discussed and modified, so that no time will be lost in coming to a final agreement as soon as they may take their place in the code structure of the industry under the master code.

On April 13 the United States engineer office, Memphis, Tenn., will open bids for the construction of 50 steel dredge pontoons, 21 feet, 2½ inches long, and 25 sections of 18-inch inside diameter by 40 feet long steel pontoons pipe. This, it is understood, is in addition to the request for bids for similar material to be opened April 5.

Late Decisions in Maritime Law

Legal Tips for Shipowners and Officers

Specially Compiled for Marine Review

By Harry Bowne Skillman

Attorney at Law

TOWER'S liability policy covering liability for collision occurring to any vessel "while in tow" of the tug covered the assured's liability for loss of cargo of a barge towed by the insured tug, though the contract between assured and the owner of the lost cargo was one of carriage. A warranty in the policy that assured would assume no liability not imposed by law was not violated by issuing a bill of lading whereby the assured assumed liability for its own negligence, where the policy also provided that the assured would not be prejudiced by the negligence in the bills of lading. In view of a provision of the policy that insurance should be void to the extent other insurance was available, but that solvency of other underwriters was guaranteed, loss, to extent covered by other insurance, could be prorated. The carrier was entitled to interest under the tower's and carrier's liability policies only from the time of payment made in satisfying the decree for cargo loss, not from the date of the decree.—*Marine Transit Corp. v Northwestern Fire & Marine Insurance Co.*, 67 F. (2d) 544.

* * *

A FERRYBOAT colliding with an anchored steamship was presumably at fault. Where the ferryboat heard the bells of the steamship, anchored in a fog, she was bound to proceed at such a rate of speed as would enable her to stop within the distance she could see ahead.—*Providence*, 67 F. (2d) 865.

* * *

SEPARATION of barge and dredge engaged in a single venture was immaterial in determining whether both should be surrendered as condition to limitation of liability to a seaman employed on the dredge for injuries sustained on the barge used as a tender to supply oil to the dredge, it was held in the case of *Standard Dredging Co. v. Kristiansen*, 67 F. (2d) 549. Said the court: "Perhaps separation might serve as a practical rule of thumb; we are quite aware of the restriction upon the right to limit which must follow upon making functional unity the test. But there is really nothing in reason to be said for such a doctrine; it exposes the remedy of the injured party to the merest sport of chance. It would

for example be a strange whimsy to say that the dredge must here have been surrendered had the barge happened to be made fast alongside, but that she need not, because there was a thousand feet of water between them. Surely that cannot be a significant difference, when substantial interests are at stake. * * * When the unity of vessels is made to depend upon their devotion to a single venture, it would be egregious to introduce a purely fortuitous condition which can have no rational relation to the interests involved."

* * *

A SHIP is seaworthy, said the court in the case of *ADA M.*, 67 F. (2d) 331, if she conforms to the requirements of her class and service, even though her owner fails to keep her up to a higher standard which he had gratuitously assumed. Owners are not obliged to construct ships of the highest safety; seaworthiness is a resultant of the added safety from the supposed device and its cost; ordinarily it depends upon the standard generally accepted in the trade for which the ship is used, though certainly in the end the court sets the standard. Failure to make water tight the bulkheads of a wooden ship used in Great Lakes shipping was held to be immaterial as respects liability for cargo damage, the law merely requiring cargo partitions.

* * *

A SHIP carpenter, while engaged in repairing a scow on a dry dock upon navigable waters, had the status of a seaman, it was held in the case of *Rogosich v. Union Dry Dock & Repair Co.*, 67 F. (2d) 377. In the absence of a statute, said the court, he could recover compensatory damages for injuries received only upon proof of unseaworthiness of the vessel. Although the term "unseaworthiness" might possibly be extended to cover a case where the owners selected and employed an incapable crew as fellow servants of the carpenter, the evidence failed to show unseaworthiness in that respect.

* * *

SHIP here held as matter of law not guilty of negligence in furnishing stevedore cable too dry for use on drum hidden from winchman, though dryness made kinks more likely to form than if core of the cable

had been as well saturated with grease as when new. Even when new such a cable would kink in use, and the danger from kinks lay, not in their formation, but in the use of the cable after they had formed and without removing them. The ship had a right to assume that a stevedore boss would exercise the care of a prudent man in working a winch with a drum out of the winchman's sight, and was not liable for death of such boss caused by the formation of kinks in the cable.—*De Luca v. Shepard Steamship Co.*, 67 F. (2d) 437.

* * *

WHERE, when a tug left port, there were no indications of dangerous weather known to her, failure to call the weather bureau for unpublished news was not negligence rendering the tug liable for damages sustained by a barge in tow in a gale. This is true, it was declared in the case of *IMOAN*, 67 F. (2d) 603 though had the master called the bureau, he would have got advices which would have kept a careful navigator in port. Failure of the tug to put into refuge ports was not bad seamanship rendering her liable for damage sustained by the barge during the gale, where to do so would have put her port quarter four points to the wind, the weather conditions apparently confirming favorable radio weather forecast, and port farther on offering a safer entry. A master may be held for lack of seamanship only where his conduct is outside the range of possible discretion; error to become fault must be gross and flagrant.

* * *

IN CASE of collision between a moving vessel and one at anchor in a proper place showing requisite lights, the burden of proof to show absence of negligence is upon the moving vessel.—*MARIAN*, 66 F. (2d) 354.

* * *

DUTY of an overtaking vessel to anticipate a possible change of course of the overtaken vessel does not require the overtaking vessel to anticipate a right angle change of course of the vessel overtaken which is believed to be, and in fact is, headed for the same narrow channel as the overtaking vessel.—*Larsen v. Portland California Steamship Co.*, 66 F. (2d) 326.

Marine Business Statistics Condensed

Record of Traffic at Principal American Ports for Past Year

New York

Month	(Exclusive of Domestic)		(Exclusive of Domestic)	
	Entrances— No. ships	Net tonnage	Clearances— No. ships	Net tonnage
February, 1934	265	1,481,004	267	1,508,905
January	266	1,649,590	284	1,629,438
December	263	1,496,477	291	1,576,199
November	243	1,257,443	277	1,452,269
October	278	1,573,534	268	1,487,869
September	294	1,847,558	289	1,771,847
August	315	1,884,475	316	1,928,611
July	311	1,719,502	277	1,536,284
June	268	1,624,929	299	1,757,814
May, 1933	273	1,709,509	274	1,640,505

Philadelphia

(Including Chester, Wilmington and the whole Philadelphia port district)

Month	(Exclusive of Domestic)		(Exclusive of Domestic)	
	Entrances— No. ships	Net tonnage	Clearances— No. ships	Net tonnage
February, 1934	42	129,940	36	109,973
January	45	139,259	47	133,427
December	54	175,715	45	135,969
November	47	144,111	40	119,896
October	68	186,588	51	152,700
September	65	182,418	44	126,290
August	61	181,283	61	178,894
July	69	203,042	53	151,781
June	51	152,234	54	149,616
May, 1933	58	157,704	49	141,334

Boston

Month	(Exclusive of Domestic)		(Exclusive of Domestic)	
	Entrances— No. ships	Net tonnage	Clearances— No. ships	Net tonnage
February, 1934	71	247,077	46	162,542
January	97	330,320	60	225,075
December	84	303,806	52	236,871
November	90	323,540	62	230,969
October	96	335,488	60	210,010
September	110	348,981	80	279,531
August	129	453,348	101	329,686
July	124	410,500	96	379,721
June	118	378,179	93	303,239
May, 1933	111	295,854	83	254,667

Portland, Me.

Month	(Exclusive of Domestic)		(Exclusive of Domestic)	
	Entrances— No. ships	Net tonnage	Clearances— No. ships	Net tonnage
February, 1934	11	27,213	11	27,213
January	9	22,908	10	25,570
December	13	31,801	13	32,589
November	15	29,335	18	35,579
October	14	27,953	14	32,913
September	15	26,225	12	28,028
August	16	28,877	18	32,727
July	11	24,324	9	23,063
June	11	24,615	12	26,271
May, 1933	13	19,020	13	23,395

Providence

Month	(Exclusive of Domestic)		(Exclusive of Domestic)	
	Entrances— No. ships	Net tonnage	Clearances— No. ships	Net tonnage
February, 1934	7	20,959	2	6,882
January	2	7,694
December	5	5,089	2	8,350
November	3	8,568	4	12,794
October	4	13,606	4	9,730
September	2	4,430	5	13,279
August	6	11,862	4	10,186
July	3	6,171	2	9,465
June	6	16,192	2	4,437
May, 1933	3	10,490	3	3,834

Portland, Oreg.

Month	(Exclusive of Domestic)		(Exclusive of Domestic)	
	Entrances— No. ships	Net tonnage	Clearances— No. ships	Net tonnage
February, 1934	25	95,774	52	198,593
January	32	116,610	50	188,401
December	31	119,833	51	184,646
November	29	108,890	35	130,457
October	26	102,926	46	173,030
September	25	97,576	38	141,839
August	22	83,506	34	129,908
July	26	99,339	29	111,559
June	20	78,651	34	120,089
May	25	98,688	28	105,115
April, 1933	17	67,220	24	97,104

Baltimore

Month	(Exclusive of Domestic)		(Exclusive of Domestic)	
	Entrances— No. ships	Net tonnage	Clearances— No. ships	Net tonnage
February, 1934	77	261,122	77	263,236
January	78	256,942	80	265,681
December	94	298,001	92	286,746
November	90	270,023	88	267,784
October	88	284,997	90	289,864
September	85	273,994	84	270,189
August	95	299,114	98	307,841
July	91	272,589	90	282,788
June	65	205,724	71	240,487
May	79	237,046	78	229,333
April, 1933	68	198,940	58	178,957

Norfolk and Newport News

Month	(Exclusive of Domestic)		(Exclusive of Domestic)	
	Entrances— No. ships	Net tonnage	Clearances— No. ships	Net tonnage
February, 1934	16	47,708	41	102,933
January	14	33,721	26	58,401
December	13	37,649	33	85,986
November	12	24,053	38	79,620
October	8	18,873	32	83,525
September	10	24,615	24	53,036
August	8	16,472	34	68,011
July	16	32,370	34	71,798
June	16	30,163	31	60,544
May, 1933	18	33,521	32	68,941

Jacksonville

Month	(Exclusive of Domestic)		(Exclusive of Domestic)	
	Entrances— No. ships	Net tonnage	Clearances— No. ships	Net tonnage
February, 1934	8	10,900	11	20,348
January	7	13,017	10	22,508
December	8	15,083	11	22,837
November	8	13,405	8	19,108
October	11	24,365	6	8,893
September	8	11,528	7	13,086
August	7	12,477	7	13,152
July	13	22,553	11	25,670
June	9	22,192	6	12,222
May, 1933	5	13,102	9	16,275

Key West

Month	(Exclusive of Domestic)		(Exclusive of Domestic)	
	Entrances— No. ships	Net tonnage	Clearances— No. ships	Net tonnage
February, 1934	23	36,476	24	36,523
January	25	39,966	22	38,764
December	22	38,764	22	38,764
November	23	33,556	22	31,330
October	22	37,180	23	39,878
September	22	38,648	23	38,659
August	18	33,210	18	32,716
July	24	39,400	22	37,180
June	27	40,569	27	42,160
May, 1933	41	55,097	39	59,075

Mobile

Month	(Exclusive of Domestic)		(Exclusive of Domestic)	
	Entrances— No. ships	Net tonnage	Clearances— No. ships	Net tonnage
February, 1934	115	268,707	112	251,232
January	118	282,972	125	298,570
December	123	279,151	109	253,209
November	114	260,755	114	249,344
October	118	247,474	124	297,436
September	116	265,547	113	266,183
August	100	223,940	102	203,716
July	110	221,610	114	236,622
June	97	206,147	91	183,736
May, 1933	95	210,743	105	231,000

Seattle

Month	(Exclusive of Domestic)		(Exclusive of Domestic)	
	Entrances— No. ships	Net tonnage	Clearances— No. ships	Net tonnage
February, 1934	54	226,118	62	251,281
January	52	221,000	55	230,995
December	54	225,842	60	246,987
November	54	222,914	51	211,474
October	58	253,865	59	254,959
September	35	154,233	40	174,263
August	40	183,028	41	182,626
July	40	168,770	40	169,815
June	36	160,127	36	157,887
May, 1933	37	149,245	38	164,025

New Orleans

Month	(Exclusive of Domestic)		(Exclusive of Domestic)	
	Entrances— No. ships	Net tonnage	Clearances— No. ships	Net tonnage
February, 1934	151	446,952	145	414,515
January	146	423,759	145	414,918
December	139	398,112	152	443,496
November	148	439,238	152	430,631
October	154	467,332	169	506,324
September	154	443,981	168	470,271
August	144	420,570	151	429,183
July	169	468,111	184	493,775
June	147	422,280	146	422,235
May	150	444,982	151	434,952
April, 1933	142	409,411	154	416,833

Charleston

Month	(Exclusive of Domestic)		(Exclusive of Domestic)	
	Entrances— No. ships	Net tonnage	Clearances— No. ships	Net tonnage
February, 1934	40	112,884	39	109,597
January	23	60,138	25	66,827
December	35	111,420	32	97,473
November	43	123,628	39	109,151
October	34	97,585	33	91,526
September	42	116,048	32	83,944
August	33	92,987	27	76,881
July	35	102,115	29	82,742
June	32	84,362	28	75,023
May, 1933	21	53,125	20	49,888

Galveston

Month	(Exclusive of Domestic)		(Exclusive of Domestic)	
	Entrances— No. ships	Net tonnage	Clearances— No. ships	Net tonnage
February, 1934	22	41,945	77	236,784
January	23	43,664	86	252,595
December	19	40,552	90	279,537
November	16	37,590	85	262,800
October	21	44,388	104	304,402
September	10	19,602	94	277,642
August	19	44,012	69	205,442
July	22	33,718	77	213,821
June	27	56,231	79	227,842
May	27	58,632	86	261,124
April, 1933	27	64,360	73	215,020

Los Angeles

Month	(Exclusive of Domestic)		(Exclusive of Domestic)	
	Entrances— No. ships	Net tonnage	Clearances— No. ships	Net tonnage
December, 1933	169	639,444	164	629,462
November	143	539,624	162	592,724
October	160	623,572	152	592,212
September	154	562,597	152	561,294
August	156	578,255	156	605,610
July	165	641,116	152	601,731
June	189	670,782	171	671,704
May	190	600,184	185	630,905
April	178	625,508	190	614,741
March, 1933	152	550,205	167	599,191

San Francisco

Month	(Exclusive of Domestic)		(Exclusive of Domestic)	
	Entrances— No. ships	Net tonnage	Clearances— No. ships	Net tonnage
February, 1934	141	503,105	154	659,366
January	163	722,800	197	764,823
December	137	616,820	172	739,604
November	144	619,874	182	806,020
October	169	753,650	168	717,133
September	150	654,888	141	658,887
August	174	748,739	170	743,918
July	156	710,857	154	717,664
June	162	715,236	162	738,436
May, 1933	160	717,412	161	680,493

Houston

Month	(Exclusive of Domestic)		(Exclusive of Domestic)	
	Entrances— No. ships	Net tonnage	Clearances— No. ships	Net tonnage
February, 1934	22	88,094	26	99,931
January	23	88,164	37	128,773

Latest Data on New Marine Work

Information on New Ships Ordered—Building and Repair Contracts Let—Shipping Board Loans Made, Authorized or Pending

THE often mentioned building of one and perhaps two additional vessels of the WASHINGTON and MANHATTAN type for the transatlantic service of the United States lines is again receiving serious consideration.

It is understood that the United States lines will go ahead at once with the construction of a third liner of the WASHINGTON and MANHATTAN type, if it is assured of protection by the government.

This matter has been brought to a head by the recently announced action of the British government in offering financial aid to the Cunard-White Star transatlantic line for the completion of the Cunard superliner No. 534 and for one or more additional vessels and for operating capital. On his return recently from England, P. A. S. Franklin, president of the International Mercantile Marine, stated definitely that plans and specifications for a new ship had been prepared and now await approval by government officials. It is therefore likely that action in requesting bids from shipyards will not be long delayed. The MANHATTAN and WASHINGTON each cost about \$10,500,000. No doubt the design of the new ship or ships will call for a number of changes and possibly greater speed.

United States Engineers

The United States engineer office at Memphis, Tenn., will receive bids until 2 p. m. April 5 for the construction and delivery of 64 steel dredge pontoons 48 feet long, 24 sections of 32-inch inside diameter by 52 feet long steel pontoon pipe, 65 sections of 30-inch inside diameter by 50 feet long steel pontoon pipe and 215 sections of 27-inch inside diameter by 14 feet length steel shore pipe.

The same office will also receive bids until 2 p. m. April 10 for the construction and delivery of one steel hull and steel deck house for dredge OMEGA. The steel hull is to have the following general dimensions: Length molded, 172 feet; breadth molded, 44 feet; depth molded, 8 feet 3 inches; width at bow molded, 26 feet $\frac{3}{4}$ -inch; length of ladder well molded, 22 feet; width of ladder well molded, 10 feet $\frac{3}{4}$ -inch. Unless otherwise specified the hull shall be built to the current rules of the American Bureau of Shipping and the American Bureau of Welding, wherever applicable. The current rules of the United States bureau of navigation and steamboat inspection will also apply.

gation and steamboat inspection will also apply.

On March 20 the United States engineer office at Kansas City, Mo., opened bids for two sets, 210 horsepower each, diesel engines and accessories for towboats.

The same office is to receive bids until March 29 for furnishing fire fighting equipment for the Fort Peck dredges.

United States engineer office, first New Orleans district, New Orleans, on March 29, was to receive bids for the construction and delivery afloat as specified, of one steel oil barge 80 feet by 26 feet.

The United States engineer office, Customhouse, St. Louis, on March 21 received bids for two four-cylinder, four cycle, not less than 70 horsepower, medium heavy duty, marine type, oil burning engines, complete with all necessary connections and operating and control facilities. These engines are to be installed in 28-foot steel hull push boats.

Bids were to be received by the United States engineer office, Kansas City, Mo., on March 27, for furnishing capstans for Fort Peck dredges. The same office also asked for bids opened March 26 for furnishing steel pipe, elbows, and valves for Fort Peck dredging units.

Bids were received on March 8 by the United States engineer office, St. Louis, for supplying one four-cylinder, four-cycle, not less than 30 horsepower, medium, heavy duty, marine type oil-burning engine, complete with all necessary connections and operating and control facilities.

On March 30 the United States engineer office, Kansas City, Mo., opened bids for hauling and hoisting winches for the Fort Peck dredges.

S. S. Manuela is Launched at Newport News

The second of the two new freighters building at Newport News Shipbuilding & Dry Dock Co., Newport News, Va., for the A. H. Bull & Co. Inc., New York, was christened the MANUELA and launched March 16. Mrs. John Bass of New York city, wife of the president of the Fajardo Sugar Co., was the sponsor. The ceremony was witnessed by officials of the A. H. Bull & Co. and guests.

The MANUELA is a sistership of the

ANGELINA, launched at the same yard on Feb. 16. It is expected that she will be ready for service in the New York and Puerto Rican trade in the latter part of May. As on the ANGELINA, attractive accommodations are provided for 12 passengers.

These two sister vessels were designed by the New York naval architects Gibbs & Cox, in collaboration with the staff of the shipyard. The general characteristics are: Length overall, 410 feet 9 inches; length between perpendiculars, 390 feet; beam molded, 55 feet; depth molded, to upper deck at side, 30 feet 6 inches; the deadweight capacity is 7250 tons on a draft of 24 feet $6\frac{3}{4}$ inches; gross tonnage will be approximately 4800 and the net tonnage, 3000.

The propelling machinery, located amidships, will consist of Newport News cross-compound turbines with double reduction gears, of 3150 shaft horsepower at 90 revolutions per minute, driving a single propeller 17 feet in diameter and 16 feet 6 inches in pitch. The sea speed is to be 13 knots. Steam is supplied by two Babcock & Wilcox marine type oil-burning watertube boilers operating at a working pressure of 300 pounds per square inch. The boilers are fitted with superheaters. There are three 15-kilowatt steam driven electric generators. The windlass, winches, and the steering gear are steam-driven, as are also the other usual auxiliaries.

These vessels are general cargo ships, accommodating 12 passengers and 36 officers and crew. There are two pole masts and a kingpost forward of the foremast. The kingpost is fitted with three 5-ton booms, the foremast with two 10-ton booms, three 5-ton booms and a 30-ton boom, which is stepped in a pedestal on the deck. The mainmast is fitted with one 10-ton and five 5-ton booms.

Both vessels are being built to American Bureau of Shipping highest class, and to comply with the requirements of United States navigation laws, steamboat inspection service, and safety of life at sea convention. Each vessel has a bale cargo capacity of about 396,000 cubic feet, fuel oil capacity of 1015 tons and a capacity of 120 tons of feedwater and 130 tons of culinary fresh water.

The Marine museum of the City of New York has issued an appeal for logs of old ships and other documents dealing with early days.

Launch Destroyer Farragut at Fore River Yard

The United States destroyer FARRAGUT was launched at the Fore River plant of the Bethlehem Shipbuilding Corp. Ltd., Quincy, Mass., on March 15. The sponsor was Mrs. James Roosevelt, daughter-in-law of the President. A bottle of champagne was used in the launching of this latest of destroyers. The new vessel is one of the first group of destroyers built for the United States navy since the completion of the war-time program in 1920, and her building was authorized under acts of congress Aug. 29, 1916, July 1, 1918, and July 11, 1919. Contract was placed on Dec. 11, 1931. She is of 1500 tons standard displacement and sister ships are now building at the Bath Iron Works, Bath, Me., and at several navy yards.

These destroyers have a length of about 340 feet and a beam of about 34 feet. They are powered with geared turbines and watertube boilers of Bethlehem design. Great advances have been made in design since the previous classes of destroyers, making it possible to obtain higher speeds at more economical rates and at less weight. The vessels are designed for long cruising radius and are fitted with a battery which will make them particularly useful for both attack and defense.

Launching conditions at the Fore River plant are ideal, as there is considerable depth of water and ample area for the full run of the ship without checking. The FARRAGUT was approximately 90 per cent complete when she was launched and it is expected that the trials will take place some time in April.

The ground ways upon which the FARRAGUT was launched are about 445 feet long, and have a slope of 1 1/8-inch per foot, as against a keel slope of 5/8-inch per foot. The cradle has an effective length of 276 feet and an effective width of 16 3/4 inches, giving a bearing of 772 square feet and an average pressure of about 9 1/2 tons per square foot. The distance from center to center of the ground ways

was 11 feet. The vessel was held in place, after keel blocks, shores and bilge cribs were removed, by steel plates, perforated with small holes. These plates were burned through at the proper time to release the vessel. Hydraulic jacks of about 100 tons capacity were provided in way of the fore poppets to assist in starting the vessel, but were not needed.

The sponsor was accompanied by her husband and his brother, Franklin D. Roosevelt Jr. and by a group of naval officers. A large crowd gathered for the ceremony.

The present FARRAGUT is the third vessel of the United States navy to bear the name of the famous American naval hero, Admiral David Glasgow Farragut. The first was torpedo boat No. 11, built in 1896 at the Union Iron Works, San Francisco, now one of the Bethlehem Shipbuilding Corp.'s plants; the second, built at the same plant in 1917, was destroyer No. 300.

Two Dredges are Ordered

The United States engineer office, Kansas City, Mo., which received bids Feb. 24 for building two self-propelled, 34-inch pipe line dredges, has awarded contract to the Marietta Mfg. Co., Point Pleasant, W. Va., on its bid of \$1,016,508 for the two; with delivery of the first in 180 days and the second in 210 days. McClintic-Marshall Corp., Pittsburgh, on a bid of \$61,202 will furnish 1000 feet of pontoon discharge pipe, with 20 pontoons.

These dredges, which are generally similar to the JADWIN and BURGESS described elsewhere in this issue, are to be of the transverse frame, steel construction and will be equipped with steam power. The general dimensions are: Length overall, 277 feet 1/2-inch; length molded, 270 feet; beam molded, 50 feet; and depth amidships, 9 feet 3 inches.

INDIAN ARROW, Standard Vacuum Transportation Co. tanker, 8328 gross tons, entered the Robins plant of Todd Shipyards Corp., New York, on March 7 for extensive repairs, which will require about 30 days.

Vinson Naval Bill Passes Calls for 102 Ships

On March 22 the United States senate and the house of representatives adopted the conference report on the Vinson-Trammell naval building bill. It became law on receiving the President's signature March 27. It gives the authorization for building 102 vessels and 1184 planes. The total estimated cost of the program is from \$750,000,000 to \$1,000,000,000. The navy department, under the authority of this act, is making plans to begin an initial building program, including 20 vessels, for which an appropriation of \$30,000,000 will be asked. The appropriation bill provides for beginning construction on this new program by July 1.

The initial construction called for by the navy department includes two destroyer leaders of 1850 tons each, six submarines and twelve 1500-ton destroyers. It also provides for an increasing airplane construction. This is the first part of a five-year program to carry out the provisions of the Vinson-Trammel bill.

Under this bill the President is permitted, if an arms limitation agreement is made, to suspend work on all vessels which were not under construction at the time the bill was approved. It is understood, however, that the administration is ready to proceed with the full program unless a reduction in armament agreement is reached.

One provision of the bill specifies that ships of each type shall be built alternately in government and private shipyards year by year. It also provides that contractors must agree to accept a figure which will give them not more than a profit of 10 per cent.

Bethlehem Shipbuilding Corp., Boston, was low bidder on repairs to the S. S. NORTHERN SWORD, damaged recently in a grounding off Winthrop, Mass., with a bid of \$48,900, 17 days. United Dry Docks Inc., New York, submitted a bid of \$52,900 and 18 days. Robins plant of Todd Shipyards Corp., New York, submitted a bid of \$54,000 and 18 days.

Bunker Prices

At New York			At Philadelphia			Other Ports	
Coal	Fuel oil	Diesel engine	Coal	Fuel oil	Diesel engine	Mar. 19, 1934	
F. o. b.	alongside	oil alongside	trim in bunk	alongside	oil alongside		
per ton	per barrel	per gallon	per ton	per barrel	per gallon		
Mar. 19, 1934...5.35@5.20	1.25	4.79	Mar. 19, 1934...4.65@4.50	1.25	4.76	Boston, coal, per ton.	\$ 8.00
Feb. 19,.....5.35@5.20	1.25	4.79	Feb. 19,.....4.65@4.50	1.25	4.76	Boston, oil, f. a. s. per	
Jan. 18,.....5.35@5.20	1.25	4.79	Jan. 18,.....4.65@4.50	1.25	4.76	barrel.....	\$1.15
Dec. 18,.....5.35@5.20	1.25	4.79	Dec. 18,.....4.65@4.50	1.15	4.76	Hampton Roads, coal, per	
Nov. 18,.....5.35@5.20	1.15	4.70 1/2	Nov. 18,.....4.65@4.50	1.15	4.76	ton, f.o.b. piers....	\$4.50-4.80
Oct. 18,.....5.00@5.75	1.15	4.70 1/2	Oct. 18,.....5.00@5.75	1.15	4.76	Cardiff, coal, per ton....	14s 0d
Sept. 18,.....4.45@4.75	1.15	4.70	Sept. 18,.....4.45@4.75	1.15	4.76	London, coal, per ton....	s -d
Aug. 18,.....4.45@4.75	.90	4.32	Aug. 18,.....4.45@4.75	.90	4.88	Antwerp, coal, per ton....	17s 0d
July 18,.....4.30@4.60	.90	4.32	July 18,.....4.30@4.60	.90	4.28 1/2	Antwerp, Fuel oil, per ton	67s 6d
June 18,.....4.30@4.60	.80	4.08	June 18,.....4.30@4.60	.80	4.04	Antwerp, Diesel oil, per	
May 18, 1933...4.30@4.60	.80	4.08	May 18, 1933...4.30@4.60	.80	4.04	ton.....	82s 6d

Note: Figures given for coal at New York and Philadelphia are for Classes A and B according to the Code; Class C is slightly less.

Fuel Oil Price Increase Hits Vessel Operators

The recent increase of 10 cents a barrel in the price of fuel oil for vessels, announced in New York on March 20, was scored by P. A. S. Franklin, president of the International Mercantile Marine Co., as placing an additional burden on operators of American vessels. For the first time in many years Mr. Franklin pointed out, fuel oil prices quoted abroad are below those now mentioned in New York.

Since March 1, 1933, when marine fuel oil was quoted at 75 cents a barrel the price has advanced almost 100 per cent. The current quotation including the new advance is \$1.35 per barrel, or an advance of 60 cents. This increase means that the bill for fuel oil of the United States liner Washington, for a round trip, has gone up from \$20,000 to \$36,000. This vessel and her sistership the Manhattan each burn approximately 27,000 barrels of fuel oil on each round voyage.

Mr. Franklin said, "I was very much disturbed when notified of the latest increase in the price of marine fuel oil. This increase is only one of several that has advanced our fuel bill almost 100 per cent in the last year. Although we have been advocating buy American, ship and travel American, we may yet be forced to protect ourselves by taking advantage of foreign oil prices which, for the first time in many years are below those of New York."

Elected Vice President

Everett Chapman, who joined Lukenweld Inc., division of Lukens Steel Co., Coatesville, Pa., early in 1930, as director of engineering research, has been elected vice president. Lukenweld Inc. is engaged in the design of welded steel assemblies for machinery and equipment.

Since joining Lukenweld Inc., Mr. Chapman has been credited with responsibility for that organization's engineering achievements in the application of welded steel construction to diesel engines and other machinery and equipment.

Safety in Stevedoring

The fifth annual Greater New York safety conference was held March 6 and 7 at the Pennsylvania hotel, New York city.

The stevedoring section of this conference held its meeting on March 7 under the chairmanship of L. D. Ransom, assistant manager, Southern Pacific Steamship Co., New York. Three papers were presented; the first by Capt. N. Kvande, terminal superintendent, New York & Cuban Mail Steamship Co., New York, on *Stevedore Accident Control Through*

Efficient Organization. This paper outlined a practical type of stevedore safety organization; the superintendent's duty in accident control; method of fixing foreman's responsibility; "shenango" labor hazards and their control.

The second paper on *Stevedoring Hazards and Their Control*, was presented by Capt. John McGrath, general manager, Atlantic & Gulf Stevedores Inc., New York. Captain McGrath dealt with specific hazards and their recognition by longshoremen; practical accident prevention measures to eliminate specific hazards; necessity for co-operation between stevedores and ship's officers to reduce accident risks.

The third paper, on the *Financial Aspects of Stevedore Accidents* was presented by Frank C. Gregory, safety engineer, United States employees' compensation committee, Washington, D. C. An abstract of this paper will be found on page 50.

Made Honorary Member

At a meeting of the Chicago Lodge No. 3 of the International Shipmasters' association of the Great Lakes, held March 1 at Chicago, the secretary, Capt. Arthur E. Bartel, made a nomination for honorary membership in the Chicago lodge in the following words:

"A gentleman, who has done a great service not alone to the marine interests of the Great Lakes, but also to all legitimate industries in the United States; a skillful yachtsman and general manager of the largest fleet of vessels flying the stars and stripes; His Excellency, Franklin Delano Roosevelt, President of the United States of North America."

This nomination on being put to a vote carried unanimously. The secretary was ordered to have made a suitable pennant to be forwarded to the President, so that he can fly it from the masthead of his yacht or ship should he honor the Great Lakes or the waterway from the lakes to the Gulf with a visit.

All-Welded Diesel Towboat

The Equitable Equipment Co., Inc., New Orleans, recently designed and built an all-welded steel towboat for the Stevens Brothers & Miller Hutchinson Co. The boat is for use on a lock construction project on the Tennessee river near Muscle Shoals.

The vessel has an overall length of approximately 42 feet, 6 inches, and an overall beam of about 10 feet, 4 inches. It is powered with a Cummins six cylinder, four cycle, solid injection diesel engine, capable of developing 85 horsepower at 1200 revolutions per minute through a two to one gear reduction.

General Electric arc welding equipment and electrodes were used in the construction of this vessel.

Improvement is Noted at Port of Baltimore

The commerce of the port of Baltimore, while far below what is still termed "normal," has shown rather remarkable advances. While the foreign exchange and currency situation undoubtedly has played a part in the export increase, the improvement in imports, in coastwise and intercoastal business, and in general maritime operations has been due largely to expanded industrial merchandising activity, to a more secure business "feeling" and toward more stable foundation conditions.

January exports and imports passing through Baltimore increased 59.4 per cent over January, 1933. Exports alone increased 90.1 per cent over last year, while imports advanced 42.2 per cent. Weekly foreign trade valuations here generally averaged \$500,000 over the corresponding weeks of a year ago, two recent weekly periods being more than \$1,000,000 ahead of 1933. Of 46 principal export commodities using Baltimore, 30 increased in tonnage over January, 1933, and of 42 principal import commodities, 29 were ahead of the corresponding month of last year.

Increases in vessel movements were more moderate, but an advance of 12.3 per cent in number of vessels and 16.9 per cent in net ship tonnage was registered in January over January a year ago. Particularly notable was the increase in the coastwise and intercoastal trades, reflecting a better national exchange of commodities and an enlarged effort to give new production a "place utility."

These increases should be viewed in proper perspective. The comparison is with a period of black despair in shipping and foreign trade. With stimulation in business has come an increased competition from other ports, perhaps more intensive than ever before.

Baltimore's natural port advantages are under general attack, the integrity of the port differentials is threatened from several sources, and a number of rail and water rate proceedings are pending which offer possibilities of serious harm to the fundamental situation. But the port's basic strength and solidity was abundantly proved during the crisis, and the rapidity with which it has risen from the low levels of a year ago is an evidence of vitality and promise for the future.

Chicago Bridge & Iron Co., Philadelphia, has been awarded a contract on its bid of \$8380 for construction of a steel barge 45 feet long x 22 feet beam x 6 feet deep, by the office of the quartermaster, Fort Monroe, Va. Delivery to be made within 80 days.

Intercoastal Shipping Inquiry To Be Continued

At the direction of the shipping board bureau a very thorough inquiry into the practices of the intercoastal trade was held in New York by the board's examiner, M. G. De Quevedo. Meetings were held practically continuously from Feb. 26 to March 10.

At the end of the inquiry, which brought out an unusually thorough discussion of the operating practices of both conference and non-conference lines in the intercoastal trade, the examiner was universally acclaimed for the fairness of the investigation. It was also felt that he had shown a thorough grasp of the complicated matters involved. It is believed that much good will come from this investigation which is to be continued on the West coast and at New Orleans, for the Gulf lines in this trade.

The inquiry did bring out that the conference system of operating has been of great benefit in stabilizing rates and practices. Both shippers and carriers would undoubtedly be better off if every line in each trade co-operated in maintaining a correct standard of rates and practices. There is a considerable opinion that under the law the shipping board bureau has authority to properly supervise conferences and agreements between lines.

This much can be definitely stated, that when the present investigation is completed in the thorough manner in which it has been carried on so far the board will have the necessary facts to base action for the kind of control which will eliminate many of the present difficulties of the trade.

The second hearing in the investigation of rates, fares, charges, and practices of ocean carriers operating between Atlantic and Gulf ports and the Pacific coast via the Panama canal has been set for 10 a.m., April 2, in the Merchants Exchange building, San Francisco, according to an announcement made March 23 by H. H. Heimann, director of the shipping board bureau, department of commerce.

A third hearing in this investigation, the purpose of which is to develop facts regarding actual conditions and promote greater stability in the intercoastal trade, will be held in the St. Charles hotel, New Orleans, during the week of April 16.

To Hold Hearings

The national recovery administration March 20 gave notice through the office of Deputy Administrator J. B. Weaver, that public hearings will be conducted, beginning at 10:00 a.m., April 3, 1934, at the Hotel Willard, Washington, D. C., on a

code of fair competition for the inland water carrier trade in the western division of the United States Columbia river district.

The proposed code has been submitted by the boat operators of the Columbia river district, who claim to represent 90 per cent of the trade.

The labor provisions of the proposed code will be the subject of separate public hearings to be held on the Pacific coast, the dates of which will be announced later.

Foreign Trade Practices

The first hearing in the foreign trade shipping inquiry authorized by the secretary of commerce on March 9, under section 19 of the merchant marine act of 1920, will be held in the Merchants Exchange building, San Francisco, beginning at 10 a.m. on April 9, according to an announcement made March 24 by H. H. Heimann, director of the shipping board bureau. Subsequent hearings will be held in New York and New Orleans, the date in each case to be announced later.

Complaints of rate-cutting and other alleged unfair practices on the part of non-conference steamship lines and tramp ships have prompted the department to undertake the inquiry. Under section 19 of the merchant marine act of 1920 the department is authorized and directed to make rules and regulations designed to correct conditions unfavorable to shipping in the foreign trade, when these conditions are the result of competitive methods employed by owners or operators of foreign flag vessels. The advisability of recommending the promulgation of corrective rules and regulations will be determined from the facts developed at the hearings.

A copy of the secretary's order authorizing the inquiry was sent to approximately 375 carriers known to be operating in the foreign trade of the United States.

Sales Representative

J. S. Carswell, well known in marine circles for some years past as manager of the marine division of Lidgerwood Mfg. Co., has opened his own office at 15 Park Row, New York city, as marine sales representative.

He will act as eastern representative for the Colby Steel & Engineering Co., Seattle, Wash., engineers and manufacturers of Barlow marine elevators, Colby cranes, lumber grabs, etc. He will also act as marine sales representative of the McKiernan-Terry Corp., builder of winches, cargo hoists, steering gears, windlasses, capstans, and conveying machinery. Because of his long familiarity with the field, it is Mr. Carswell's intention to specialize, as much as possible, in marine auxiliary and cargo handling equipment.

Board Takes Over Control of Export Line

A reorganization of the Export Steamship Corp., operating a large fleet of American passenger and cargo vessels between New York and Mediterranean and Black Sea ports, has been worked out by the shipping board bureau's director Henry H. Heimann and the directors of the line, headed by C. L. Bardo, president of the New York Shipbuilding Co., which has equities in the line on account of the new vessels built for the line. Outside of the government the shipbuilding company is said to be the largest creditor.

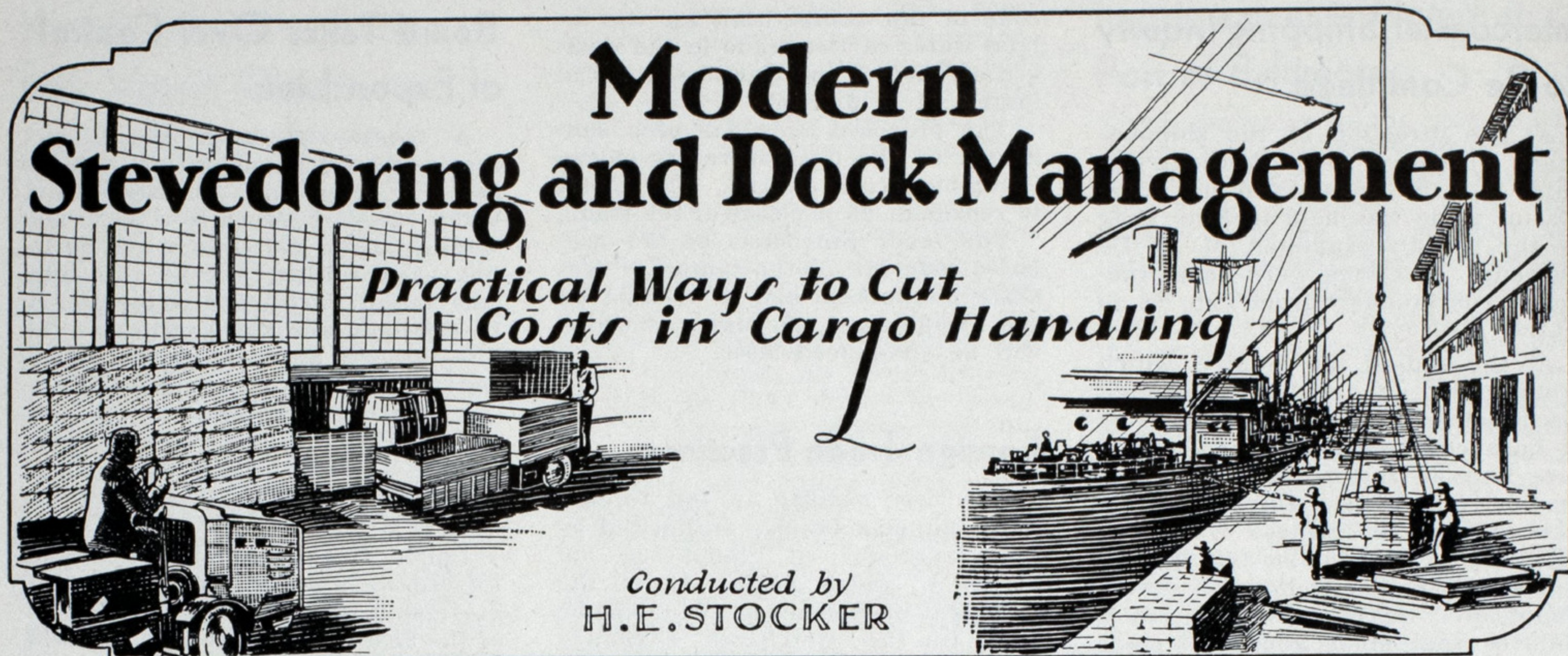
Under this arrangement, W. H. Coverdale, president of the Canada Steamship Lines Ltd., and a member of the firm of Coverdale and Colpitts, efficiency engineers, New York, becomes the new president of the line and a director, succeeding Henry H. Herbermann, who also resigned as director, but who will continue as a vice president. H. E. Frick, vice president and general manager of the Export line also resigned from the board of directors and was succeeded by J. E. Slater of the firm of Coverdale and Colpitts. Mr. Frick will continue as vice president.

In addition to Messrs. Coverdale and Slater, the other directors of the line as reorganized will be C. L. Bardo, president of the New York Shipbuilding Co.; Arthur L. Foran, representing the Philadelphia National bank; and Theodore L. Smith, of the Central Hanover Bank & Trust Co.

It is understood that outside of the changes mentioned, heads of the departments of the company will continue in their usual duties. Regular schedules in the passenger and freight services will be maintained as heretofore to the Mediterranean and the Black Sea.

Mr. Herbermann has long been a prominent factor in the operation of American vessels in the foreign service. After a period of operating shipping board vessels from New York to the Mediterranean he purchased some 18 shipping board vessels. This was in August, 1925, long before the Jones-White law went into effect. When this law was passed his line received a mail contract and he was one of the first operators to place orders for new vessels under this law. These vessels, the EXCAMBION, EXOCHORDA, EXETER, and EXCALIBUR, fine combination passenger and cargo vessels, were completed at the New York Shipbuilding Co., Camden, N. J., late in 1930 and 1931. These vessels proved popular and did an excellent business until the depression seriously affected the trade they are engaged in.

Offices of Lloyd's Register of Shipping at Philadelphia will, from April 3 on, be located at 1600 Arch street.



Paving the Way for Increased Profits By Judicious Expenditures

By H. E. Stocker

ALL expenditures should be considered as contributions to the production of profit. It is not a question of what the company can afford, but rather whether money can be expended on the organization and an adequate return obtained for the money so expended. It is a question of productivity. The traffic organization produces traffic, the accounting organization "produces" lower costs by providing analytical records promptly. The operating department "produces" lower costs and the transportation service which the traffic department sells.

That part of the operating department's activities to which this section of the MARINE REVIEW is devoted, particularly cargo handling, involves production of service in the prompt handling of cargo with a minimum of loss and damage at a minimum of expense. An expenditure for a traveling port superintendent of \$4000 a year may stop damage to cargo and prevent the loss of valuable traffic; fifty tons a week at a five dollar a ton rate will more than pay his way. In addition his supervision of loading and discharging can result in savings exceeding his salary and expenses several times.

Value of New Ideas

This is true even in an organization which is managed with the highest degree of effectiveness. A few new ideas picked up by contacts with other operators will save money in the best managed cargo handling operation

anywhere. The best managed organization has not a monopoly on brains and hence not a monopoly on new profit producing ideas.

The author recently supervised the discharging of a ship at an outport. The operation took one working day and in that time he saved the company over eight times his salary for that day and in addition obtained new business for the line which equalled 50 per cent of the above saving.

In another instance a ship was discharging at an outport and the company economized by not having anyone supervise the operation because of the expense involved. As a direct result of this failure to understand the productive value of such an expense, the company lost traffic which would have paid a traveling port superintendent's salary and expenses several times.

Letter writing is an imperfect means of supervision, so much so, that expenses for even long trips are justified because of the greater results obtained by direct personal contact.

Savings made by reduction of costs may be utilized to finance other savings. A saving of \$10,000 a year in cargo handling costs may be the means of providing the money to pay a shipyard for cutting sideports in a ship or two. This in turn results in additional savings which may be considered as profit or used to finance other improvements.

One excellent point about this plan is that it is possible to cut cargo handling costs with little or no capital

expenditures. Either the reduction is obtained by supervision alone or the equipment which is required is paid for from savings.

Records are a vital tool to obtain good management. When compiled accurately they are statements of experience. They help men to remember accurately and assist greatly in preventing personal feelings and prejudices from causing unsound decisions.

Cargo Handling Records

The cargo handling records of many companies are inaccurate and incomplete—and the reason, in some cases with which the author is familiar, is the desire to avoid the expense of employing a \$35 a week clerk. It is considered an unproductive expense. This lack of clear understanding is to a large degree due to the customary division of expenses into productive and unproductive; the distinction being between the expense incurred in the direct work of loading and discharging and keeping records about this loading and discharging. Modern management, however, realizes that adequate records improve the results obtained by the expenditures made directly and are therefore themselves productive—productive of profit.

Besides providing adequate personnel so that these opportunities will not be missed, productivity of the organization can be increased in several other ways; wage incentive or bonus plans, developing the sense of craftsmanship, providing good light-

ing, ventilation and other environment factors—and planning and managing the organization in accordance with the basic principles concerned.

Conversely, productivity is decreased in several different ways, excessive caustic criticism, slave driving tactics, unfairness in wage and salary adjustments and dismissals without adequate cause.

Wage incentive or bonus plans have been discussed previously. The value of such plans in increasing the productivity is indisputable when the facts are known. The same basic idea should be considered in the relations with contracting stevedores.

Payment on a basis of fixed rates does not give sufficient incentive. If the stevedore knew that a reduction in costs would not be made a reason for browbeating tactics to force rates down and get *all* the savings for the steamship line, he would have more incentive for trying to cut costs.

Good Relations With Stevedores

Relationships with contracting stevedores may be bungled with loss to the steamship line or such relationships may be handled with intelligent selfishness to the line's profit. Expecting the stevedore to shift cargo back and forth from pier to pier without any additional cost is not unfair provided the line had the additional piers when the contract was made. The stevedore presumably made his rates on basis of the conditions of the operation of the company's terminals at the time the contract was signed. However, if these conditions are changed so that the contractor's costs are increased materially, then he is entitled to adequate additional compensation. On the other hand, if the company so changes conditions that the stevedore's costs are *reduced* materially, the contract rates should be reduced. If, for example, the operations are shifted from a small badly congested terminal to a large terminal with space adequate for an economical and speedy operation, the contract stevedore's costs are reduced and the rates should be reduced proportionately.

Men's productive efforts can be increased by developing a sense of craftsmanship.

Good lighting in offices is profitable because it reduces eye strain and reduces work by making figures, writing and printing stand out clearly.

On the terminal proper correct lighting reduces accidents and improves the work of the men.

Ventilation is another factor that cannot be safely ignored. If it does not actually reduce a person's efficiency by physical reactions, it causes, it certainly reduces efficiency by the psychological reactions resulting.

Productivity of the organization is increased by planning and organizing it in accordance with the basic principles concerned.

One of the most important principles is the delegation of work and authority. My experience has made me certain that in the long run an organization gains most by delegating work and authority, even if the men to whom delegated, are not of the highest quality, because more is gained from a man by this method than by minute checking up.

Authority and responsibility are inseparable and they are essential to effective results.

Giving a man responsibility without authority is the same as asking him to construct a house without proper tools; the results are not satisfactory. It may be a house but the roof leaks, the doors jam, and many other sources of annoyance and loss are encountered.

The most profitable point of view of management is that of being constantly on the alert for new ideas. Most organizations are lacking in some respect in their "new idea facilities." Instead of being on the alert for new ideas which would reduce costs and increase revenues, a wall of resistance has been built to such opportunities for additional profit. This condition is largely due to the lack of a scientific point of view which has gained wide acceptance in manufacturing industries and in marine engineering and naval architecture, but very little recognition in the other parts of the industry.

If a man finds a new type of sling for handling canned goods which reduces damage to cargo or speeds handling, he creates in effect a fund out of which he can be paid and out of which profit can be obtained. The basis of paying the man a part of the saving is not that it is fair, but rather that it is intelligent management to do so because it gives the man an incentive to save more money.

Once the value of adequate new idea facilities is recognized, employment of consultants naturally follows.

A Real Consultant

Some shipping men are bitterly opposed to consultants because of their experience with "efficiency experts"; they are justified in this opposition. However, a real consultant is *not* an efficiency expert. Consultants must be employed with great care because not every one who makes claim is entitled to the term. W. H. Leffingwell states that:

"There is, however, one infallible test by which the actual scientific management consultant can be differentiated from those who make a false pretense to be so considered. In almost every case, the latter has a panacea, a scheme, or system, which he claims will at once cure all the ills of the office, and all he desires is an opportunity to "install" this system. The real expert pays his way, but he does not do it by bringing in, from the outside, a cut and dried method, which

is applied to the office on the same principle that a porous plaster is applied to the back of a quack's patient. His work is profitable because of the teaching and guidance he gives the organization in helping it solve its own difficulties and assisting in the development of a method of scientific control especially adapted to its particular conditions."

Fear of criticism, particularly petty criticism, and fear of discharge will get more work out of some people, but these people are not the best people for an organization. They should be eliminated as rapidly as practical.

One steamship line prides itself on the efficiency of its cargo handling operations with respect to mechanical equipment. Much has been accomplished but the personnel policy of this company with the longshoremen is so utterly out of tune with the best modern practices that opportunity for additional profits are lost. The men are cheated on time, brow beaten and slave-driven, and when the foreman is not around, how they do soldier!

If a foreman has a new idea, it has little chance of becoming profitable to the company because the stevedore is not big enough mentally to grasp it, and if he goes to the pier superintendent he will lose his job because he went over the stevedore's head.

Outward Acquiescence

An executive is only fooling himself when he obtains outward acquiescence in his plans and ideas by brow-beating methods. His assistants "yes" him and keep constantly in mind the necessity of avoiding criticism so that the emphasis in their work is shifted from profit to the company to self-preservation. The assistant keeps out of trouble for the most part, and the company loses profits. In my experience I have seen an organization almost entirely paralyzed with respect to the initiative of its members by reason of such management methods.

A feeling of resentment stirred up by an injustice on the part of a "boss" can exert an influence on a man's mind strong enough to nullify the benefits of economic motives.

Good management in dealing with subordinates is a great lubricant in an organization which does much to reduce friction and accomplish profitable results.

The management methods described in this article are based upon intelligent selfishness. Industrial history shows conclusively that these methods are intelligently selfish. These facts of history cannot be dismissed with a mere statement that "I don't agree" or "I don't think so."

If these conclusions were based upon the author's own opinion, he would be hesitant in expressing them because, within reasonable limits, one man's opinion is as good as another's. But these conclusions are not based upon opinion, but upon facts.

Cost of Stevedore Accidents, At Port of New York

By Frank C. Gregory*

FOR the past five years the rate for insuring compensation costs under the longshoremen's act in New York has been more than 15 per cent of the payroll and has been rising. Conservatively, then, more than 10 per cent of the total cost of stevedoring has gone to pay for the direct cost of accidents. Total numbers of accidents and total dollar costs for the port are hard to tie to company experience for comparison. So an attempt will be made to state accident cost on a man-hour basis.

There is not enough information on the number of man hours worked on shipboard in a year to compute an accurate frequency rate. There is enough basis for the statement that this rate is more than 100 lost-time injuries per million man hours worked. The rate of 100 is used here to illustrate the seriousness of the condition which exists.

A million man hours represents 400 men working eight hours a day for 313 days. A frequency rate of 100 tells us that during that time one of each four will receive an injury severe enough to cause him to lose time from work beyond the day of the injury. The injuries to longshoremen are more severe than for other industries, the figures here being the actual five year average of the port. Four hundred regularly employed longshoremen received 100 injuries a year, classed as follows: 20 disabled seven days or less, no compensation; 65 temporary disability, average nine weeks; 14 permanent partial disability, average 44 weeks; and 1 fatal, average cost to employer \$6000.

Accident Rates Vary Widely

These 100 cases cost, for compensation and medical, \$37,800, or \$378 for each time a lost-time injury occurred. This average accident cost is based on a sufficiently large number of cases so that it should be applicable to all employers, except where definite measures have been taken to control the causes of the serious accidents.

The rate of the individual companies varies over a wide range, probably from a frequency of 30 to one of 300. The probabilities are that the one with the lower rate has also avoided the more severe injuries. But on the same cost per accident

basis, if stevedore A has a rate of 30 at the head of the list and stevedore Z is at the bottom with 300, after each had worked a million man hours, stevedore A's compensation bill will be \$11,340, while his competitor Z will find that his is \$113,400. That difference in placing the decimal point looms up big on the balance sheet!

Two years ago Leon Senior of the compensation rating bureau gave to this group an illustration of the effect of accidents on the insurance rate. If a stevedore with a \$50,000 annual payroll had five serious accidents in the year, his premium rate, on an experience basis, was affected by 63 per cent, and went into the debit rate. On the basis of 15 per cent premium he would pay \$7500 a year. The five injuries made a difference of \$4725 a year in this rate.

Considered from another angle, the 99 non-fatal cases above averaged twelve weeks, or practically three months disability. Twenty-five of the 400 men were continuously away from work on account of injury. One man out of 16 was being supported in the hospital by the other 15. The industry is compelled to support 6 per cent more longshoremen than its maximum need for labor.

Important Factor in Costs

The situation in the port has caused some companies, who have found they can control their accidents, to go self insured, and the insurance companies to establish credit and debit ratings for the others, so that the good risks are not carrying all of the excessive losses of their competitors. At present there is a total spread of cost ranging from not over 6 per cent to at least 24 per cent of payroll.

The competitive condition which resulted has compelled the high cost stevedore to cut all possible corners in order to exist, and often to the detriment of his principals and of the labor relations in the port. Desperate attempts to squeeze out a profit under these conditions generally results in still further unsafe practices, and increased insurance cost, and more protest from labor until the stevedore is obliged to "fold his tent."

The ship operator cannot escape paying a considerable portion of the bill. Whether his competitive position is endangered or not depends entirely upon his trade, but he is undoubtedly in the best position to reduce accidents in the port, because

he hires the stevedore. He would do well to keep informed on his accident frequency. A good safety record is one of the best endorsements a stevedore can have, assuring his principal of a minimum cost of accidents, both direct and indirect, and of an efficient and well trained organization.

No effective control of accidents will be had until the ship operator and stevedore want it. It must come through their direction. With this in effect, the interest of the longshoreman to avoid injury can be stimulated. Very little has been done, so far, toward this end. In fact, during the past few years some claim agents have broadcast the impression that the longshoreman is better off financially injured than working. If there is a definite wage loss to injured men, it should be used as the most powerful argument in urging them to work safely.

The compensation law provides that an injured employee shall receive two-thirds of his wages if disabled beyond seven days. In New York there is in effect an "agreed rate" of compensation, regardless of earnings. At the present time it is \$16 per week on the assumption that the average wage is \$24. That means that a longshoreman would work less than an average of two days per week, or have annual earnings of less than \$800 per year, before he would "break even" on compensation.

Loss of Time Due to Injuries

Of each 100 longshoremen injured in this port during the last five years 20 have returned to work in seven days or less, and received no compensation for lost time; 52 have returned between seventh and forty-ninth day; 27 were disabled 50 or more days, and 1 was killed. The average compensation to the dependents of the dead man was \$6000, or less than half of his probable future earnings. The losses of the other 99, without attempt to include other than wage loss on a \$24 a week wage basis, were:

20	TTD average loss	\$ 12	\$ 240.00
52	TTD average loss	40	2,080.00
13	TTD average loss	232	3,016.00
14	PPD average loss	352	4,928.00
<hr/>			
99	non fatal average	\$103.67	\$10,264.00

On this basis, the longshoreman's wage loss is about one-third the combined compensation and medical bill of the stevedore. If this is the case, why conceal such an excellent argument for safe working, in order to advertise the occasional malinger?

The longshoreman can also figure his chances of being disabled by injury. If he is lucky enough to work 213 days in a year, he stands a 1 to 4 chance of temporary injury, a 1 to 28 chance of permanent impairment, and a 1 to 400 chance of being killed. Stevedores whose records are better than this average have a right to let their employees know the additional security to be found in their employment.

*This article is a part of the paper presented by Frank C. Gregory, safety engineer, United States Employees' Compensation commission, at the fifth annual Greater New York safety conference held at the Pennsylvania hotel, New York City, March 6 and 7, 1934.

Useful Hints on Cargo Handling



SMOKING on deck, or in cotton cargo spaces should be strictly prohibited and "No Smoking" signs should be posted prominently around the deck, forward and aft. Smoking on dock, in cars or adjacent to docks should not be permitted. Open lights or torches should not be used on deck, while loading, or in any compartment where cotton is stowed. Spark arresters (wire netting) should be fitted on main, donkey boiler, and galley stacks. Tug boats whose stacks are not screened not to be allowed alongside the vessel while the cotton hatches are open.

All ventilators leading to cotton cargo spaces should be closed or protected against entrance of sparks. Wet cotton should not be loaded nor should any cotton be loaded during rainy weather, except by special permission. Cotton that has been damaged by fire or oil should not be stowed under deck.

Fire hose and nozzles should be kept attached to fire plugs forward and aft; hose to be racked or laid out ready for quick service, and to be of sufficient lengths to reach all parts of vessel. Casks of water and fire pails should be provided and distributed. One cask and two pails opposite each hatch, forward and aft.

All steam, oil or water pipes passing through cargo spaces should be securely protected against damage and thoroughly tested before loading cotton in any compartment where such pipes are installed. After loading has been completed for the day, one corner of the tarpaulin on the hatch to be left loose for a period of approximately two hours, at which time it is to be lifted by the ship's officer for the purpose of determining whether fire of any nature has been left in the cotton. This is so that should such a fire occur it can be extinguished with little difficulty, whereas, if it is allowed to smolder and burn away for a greater length of time, much damage will probably result.

Sorting Made Easier

THE principle difficulty in discharging coffee is sorting the bags according to the marks. This slows down the operation as the sorting must be done on the pier while discharging, and makes it less convenient to use mechanical equipment in transferring the bags from the

THIS page is being devoted to short items on all matters having to do with the more efficient turn-around of ships. These items are intended to be of a helpful nature.

We will welcome for this page brief descriptions, illustrated if possible, of any better or safer way of performing any function in cargo handling. Also, any questions submitted will be answered by the editor.

apron to the pile in the shed.

An experienced pier superintendent suggests that the shipper be given numbers, to be placed on the bags at the time he books his freight. Under the present system, if a shipper has a number of bills of lading it is rather difficult to distinguish the marks due to their slight variations. If consignor A had 1000 bags of coffee to ship to ten consignees, consignee A would be given numbers 1-100, consignee B would be given numbers 1-200, etc. This plan would reduce to a minimum the mistakes in sorting and speed up the operation considerably. Sorting sheets may be eliminated.

This plan has been operating successfully in shipping tomatoes from Florida to New York.

Deviation Insurance

DEVIACTION insurance on the cargo on board should be obtained when a ship leaves her regular route to call at a port to load or discharge. To avoid failure to obtain insurance because of decision to cause a deviation after office hours or for any other reason, it is wise to endeavor to arrange to obtain a blanket policy for the line to cover any deviation that may be made.

A company in New York sells a chemical which mixed with water makes an effective snow and ice removing compound. Removal of snow and ice is necessary to safe and effective working of the men.

Many fleets of trailers could be equipped with the new type industrial rubber tires to advantage. The new compound used in tires for trailers

reduces the power necessary to move a load and reduces maintenance.

Eastern Steamship Co. carried keg beer last summer in one of the lower hold compartments of the SAINT JOHN and the ACADIA at a temperature of around 45 degrees without refrigeration of any kind. The compartments are small and just over the tank tops so that even in warm weather they were cool and suitable for beer stowage.

Keeping Men Posted

THE following from Capt. Liddell Hart's military book *Real War* is applicable to a shipping organization: "Secrecy leads to rigidity of tactics; open discussion and criticism, to flexibility and well tuned initiative of subordinates when confronted with the unexpected.

"Students of military history know that attempts to keep tactics secret defeats its own end—and its own employer.

"Only a matchless harmony of execution, through practice and understanding, which gave them the advantage no rival or imitator could overtake."

A fine new German ship was recently in New York. This ship appeared to be modern in every respect but for one thing—there were only single booms at the forward and after hatches. It is difficult to understand why shipowners cannot see that saving the cost of an extra boom at each hatch is not an economy in the long run.

Handling of Fertilizer

LARGE bags of fertilizer, weighing 125 pounds are stacked in small net slings in the hold. Nets are 6 x 6 feet and hold twenty bags each. These are hoisted by burton fall and landed on platform slings, which have been laid on boxes on the apron or on trailers. Platforms are lifted by power lift trucks and the trailers are towed to cars which have been spotted in the depressed track in transit shed. Trailers and platforms are taken directly on the flat cars and the bags are discharged by hand and stacked six high on cars.

Fog Navigating Camera Used On Liner Manhattan

FOG, that deadliest enemy of the seafarer, which is charged with responsibility for three out of every four ship casualties, is being assailed by science from an entirely new angle in a device which, after test on several voyages, has now found a place on the navigating bridge of the S. S. MANHATTAN as a regular feature in the elaborate safety equipment of that most modern of America's liners.

This new device, the invention of Capt. Flavel M. Williams, U. S. N. R., and known as the fog navigating camera, utilizes the infra-red rays, those light rays having a wave length beyond the range of human vision, to record fog-hidden objects on a specially-sensitized film in a record which does not differ materially from that made by visible light on ordinary photographic film, exposed in the usual manner. Within a single self-contained unit, the Williams camera photographs, develops and "fixes" the film.

Description of Fog Camera

Physically, the fog navigating camera is a longish duralumin box, designed for mounting on a tripod so that it may be sighted in any direction, and the relative bearing of the picture taken may be read from an azimuth circle installed on the top of the tripod or a true bearing may be read from a compass which can be attached to the camera. This duralumin case compactly houses a lens, a shutter arrangement, a holder for infra-red sensitive film, and a developing and fixing compartment. The film, especially produced by the Eastman Kodak Co. of Rochester, N. Y., is a continuous strip coated

with a special infra-red emulsion, and the film is exposed through a special Schneider apochromatic color-corrected lens between the elements of which an infra-red ray filter is inserted. The exposed portion of the film strip is immersed in a concentrated developing bath for 30 seconds, during which time another exposure has been made on the second frame of the film strip. The first frame is moved, by means of a knob, from the developing bath to a fixing bath of "hypo" and the operator may then view the "fixed" negative which he exposed only thirty seconds before.

Not only does the navigator increase his vision by several times over the actual range of the eye in fog or haze, but it is also possible for him to determine the correct bearing of the objects appearing on the viewed negative by means of a photographic scale fixing their positions in relation to the heading of the vessel. By taking two successive photographs, he may also determine the speed and course and approximate distance from his ship of all those objects appearing on the negative, as well as the true bearings of all stationary objects.

Visibility Greatly Increased

With the Williams camera installed on the bridge, the navigator may see exposures made at such intervals as conditions demand, enabling him to proceed safely through haze and dense fog which, ordinarily, would call for greatly reduced speed or might even necessitate dropping anchor and standing by for clear weather. Repeated tests have shown that when the visibility to the

naked eye was only 400 feet, negatives taken with the fog camera revealed objects a quarter of a mile and more distant. In fact, the Manhattan's staff photographer took one negative with the fog camera that showed the Atlantic Highlands six miles away, although the coast line, obscured by haze, was not visible to the eye or to the ordinary camera.

Capt. A. B. Randall, master of the Manhattan and commodore of the United States lines, who has had this initial installation of the fog navigating camera constantly under his eye, does not hesitate to pronounce it "the greatest boon to navigation since radio" as he matter-of-factly displays pair after pair of photographs showing "no visibility" with the ordinary camera while the fog camera, with simultaneous exposures, clearly shows dangerous obstructions ahead. A prize pair of these films shows a perfect picture of a "pea soup" fog—a blurry blank—made with panchromatic film in an ordinary camera, while a fog camera negative, snapped at the same moment, pierced a thousand feet of almost impenetrable harbor vapor to disclose a vessel ahead.

Economic and Safety Features

Obviously, the perfecting of such a device as the fog navigating camera will extend great economic benefits to shipping as well as afford new high levels of protection for life and property at sea. The master of one favored ocean liner in the transatlantic trade estimates that a day's delay to his vessel, occasioned by fog, costs his owners about \$7000. Another master cites an instance in his own experience when his ship, laden with perishable cargo, was so delayed in reaching port by fog conditions that the cargo was ruined; shippers successfully prosecuted suits against his company which involved verdicts of over \$250,000.

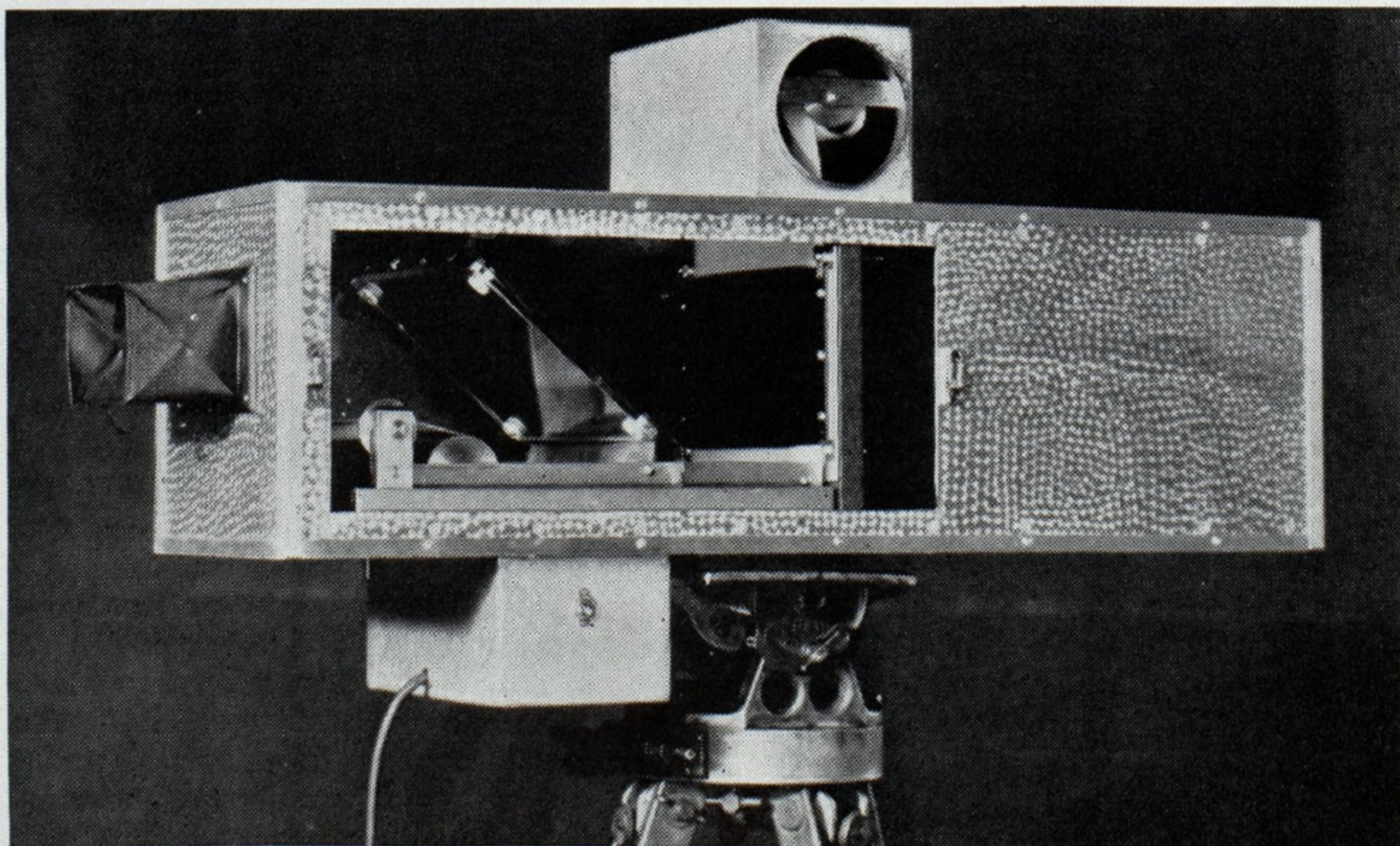
Capt. Flavel M. Williams, the inventor and patentee of the fog navigating camera, is a physicist who has devoted many years of research to those areas of electromagnetic waves beyond the visible spectrum and with this he combines a thorough practical knowledge of seamanship.

After 13 years in the United States navy, he resigned with the rank of lieutenant commander and now holds that rank in the naval reserve. He was in command of the armed guard aboard the Antilles until she was torpedoed and was then appointed radio inspector for the Allied governments at St. Nazaire. Following the War, he was employed by the General Electric Co. in Paris as a research engineer, directing a staff of 800 research men. He received the degree of electrical engineer from the Ecole Supérieure d'Electricité in Paris.

Four Years of Experimenting

In 1931, he was appointed by the United States navy department to

(Continued on Page 54)



Fog navigating camera, housing open. Infra-red sensitive film used. Viewing mirror and compartments for developing and fixing bath

Up and Down the Great Lakes

Domestic Grain Shipments—Expect Heavy Coal Movement—
Organize Toledo Propeller Club—Rejects Seaway Treaty

SHIPMENTS of domestic grains and flaxseed on the Great Lakes in 1933 were about 10.5 per cent larger than during 1932, according to a compilation of records for the principal ports of origin. Duluth-Superior, Chicago and Milwaukee shipped 128,023,725 bushels last year, compared with 115,933,558 bushels in 1932. Chicago was the only port to show a decrease, the movement from there declining from 63,462,000 bushels in 1932 to 51,725,000 bushels in 1933, a drop of 18.5 per cent. Milwaukee shipments increased 368 per cent, while from Duluth-Superior a 25.9 per cent gain was recorded.

Complete figures follow:

(Thousands of bushels)		
	1933	1932
Milwaukee	14,062	2,989
Chicago	51,725	63,462
Duluth-Superior	62,235	49,482
Total	128,023	115,933

Buffalo was the principal destination for these shipments, 89,982,750 bushels, or about 70 per cent moving to that port. Of this total 48,716,891 bushels was wheat. Wheat shipments from the three points amounted to 54,294,901 bushels, of which total 42,269,361 bushels originated at Duluth-Superior. Chicago headed corn shippers with 37,279,000 bushels of a total of 50,922,801 bushels. Shipments of oats last year totaled 12,004,756 bushels, with 6,779,000 bushels originating at Chicago.

Flour shipments from Chicago in 1933 were 1,030,000 barrels, compared with 1,374,000 barrels in 1932 and 1,704,000 barrels in 1931.

Expect Big Coal Movement

On March 19, shipping between Toledo and Detroit started the season of 1934 by the clearing of the Pringle barge BARKHAMSTEAD, loaded with coal, from the Chesapeake and Ohio docks at Toledo for Detroit. No serious difficulty was anticipated on account of ice. Navigation lights in the harbor were placed in commission on the same day.

Actual opening of navigation on the lakes generally will depend on ice conditions and may be rather later than usual. It is expected, however, that the Great Lakes Transit Corp. will begin operations not later than April 30 and possibly earlier.

Lake operators engaged in bulk

freight movement are anticipating an early and heavy demand for tonnage in carrying coal. Coal stocks on hand at ports of the upper lakes and also on Lake Ontario and Erie are said to be at the lowest point in years. It is believed that coal shipments will show a substantial increase over the 31,776,654 tons carried during 1933 which represented an increase of more than six and three-quarters million tons over the movement of 1932.

The balance of ore remaining on docks of Lake Erie ports, March 1, totaled 5,175,886 tons, as compared with 5,105,339 tons on March 1, 1933.

February Lake Levels

The United States Lake survey reports the following monthly mean stages of the Great Lakes for the month of February, 1934, determined from daily readings of staff gages.

Lakes	Feet above mean sea level
Superior	602.21
Michigan-Huron	577.44
St. Clair	572.18
Erie	569.61
Ontario	243.69

Lake Superior was 0.14-foot lower than in January, and it was 0.25-foot above the February stage of a year ago.

Lakes Michigan-Huron were 0.02-foot lower than in January, and they were above the February stage in 1933.

Lake Erie was 0.36-foot lower than in January, and it was 0.99-foot below the February stage of a year ago.

Lake Ontario was 0.10-foot higher than in January, and it was 0.62-foot below the February stage of a year ago, 1.49 feet below the average stage of February of the last ten years.

Propeller Club Meetings

The Propeller club of the port of Cleveland held an informal luncheon meeting at the Hollenden hotel on March 16 to meet Arthur M. Tode, national president of the Propeller club of the United States. A. T. Wood, president of the club, presided. Some 75 members and guests attended.

In his address Mr. Tode outlined the activities of the Propeller club in its championship of the American merchant marine. He suggested that lake shipping where it comes into

competition with foreign shipping is entitled to government aid and protection in the same manner as that now suggested for ocean shipping under the proposed subsidy policy recently announced by Secretary Roper.

He referred to the senate committee investigation of mail contracts and the action taken by the Propeller club of the United States to offset the erroneous conclusion which might be drawn from the findings of the committee and to promote a correct understanding of the merchant marine on the part of the public.

On leaving Cleveland, Mr. Tode went to Toledo, where he aided in the organization of a local Propeller club. Toledo is the thirty-first port in which a Propeller club has been established, three of which are in ports of foreign countries.

Officers of the newly formed Toledo club are: President, Joseph F. Rawlinson, superintendent, Toledo Shipbuilding Co. Inc.; vice president, Jack Minkow, president, Harbor Terminals Inc.; secretary-treasurer, L. N. Watson, engineer, civil works administration. Capt. R. B. Millard, local manager, Great Lakes Towing Co., was elected temporary chairman of the board of governors.

Seaway Treaty Rejected

On March 14 the United States senate voted on the resolution to ratify the St. Lawrence waterway treaty. The treaty failed of ratification as it could muster only 46 votes in favor. Forty-two senators voted against ratification. As two-thirds of the membership is necessary for ratification, sentiment against the treaty proved much too strong. Opposition to the treaty in the New England states, along the seaboard, in the Gulf region and Mississippi valley states proved more than sufficient to defeat the treaty. Those senators who disapprove of the seaway because of sectional interest were supported by scattered votes from other sections.

It is expected that the treaty will be returned to the senate in the next session. President Roosevelt had strongly urged ratification and followed up his first communication to the senate recommending favorable action with a special message, emphasizing his reasons for ratification in the national interest.

Fog Navigating Camera

(Continued from Page 52)

lead the preliminary American Polar expedition to the Arctic for the purpose of research to determine the relation between terrestrial magnetism, the Heaviside layer and the Aurora Borealis, with the cooperation of the Naval Research laboratory. It was about four years ago that Captain Williams, who had made many striking detail photographs from great distances by the use of the infra-red principle, decided to adapt it to navigation. The fog navigating camera is the result of his experiments.

The Fog Navigating Camera Corp. of which Captain Williams is president, is located at 181 Morgan street, Jersey City, N. J., and is now in limited production of cameras which either may be purchased outright or leased by ship operators. Facilities have been organized at the factory to provide a week of instruction, without charge, to the operators of camera purchasers. In that time they may become thoroughly familiar with the instrument itself as well as with the main factors involved in its use, such as the proper time of exposure under varying conditions of fog and haze and the appropriate strength of the developing solution.

To Dock at Cherbourg

Passengers of the Lloyd liners BREMEN and EUROPA embarking or disembarking at Cherbourg, will leave and board these two express liners directly at the large new piers at the French port beginning with the call there of the BREMEN on April 14 on her west-bound voyage to New York.

This acquisition of docking privileges at Cherbourg is following out the program of the lines to facilitate the landing and embarking of passengers at all Hamburg-Lloyd ports of call on the North Atlantic run. It is now possible for all BREMEN and EUROPA passengers homeward bound from Europe to board these liners directly from piers at Bremerhaven, Southampton and Cherbourg and to land in the heart of Manhattan at the foot of West Forty-sixth street at the completion of the voyage.

Second Class Eliminated

Second class in the BREMEN and EUROPA, the last two liners to carry this class on the North Atlantic, with the April 8 sailing of the EUROPA and the sailing of the BREMEN on April 22, both from New York, will become the new part of tourist class.

This decision to abolish a class which has been a successful and attractive feature of the BREMEN and EUROPA, is in line with the trend to make available to the public better accommodations at lower rates, and

to lessen class distinctions.

In this connection, it was pointed out that certain staterooms with bath, which were formerly included in the first class sections of the liners and on which the tariff was in excess of \$600 only a few years ago, may now be had for \$139.00 as part of the newly enlarged tourist class. The space now to be occupied in the BREMEN and EUROPA by this increasingly popular class, has by the inclusion of second, been more than doubled. All the deluxe features of second class, such as elevators, gymnasiums, swimming pool and shops, will be retained. The sun decks, sport decks and promenade decks of second class will be available to tourist class; likewise the lounges and dining rooms will be at the disposal of all passengers in this class.

Truss-Weld Tank Barges

The American Mineral Spirits Co., New York, has awarded contract to United Drydocks Inc. for construction of three 150,000-gallon nonpropelled tank barges and work will be started at once, at the Staten Island plant.

The vessels are to be of the patented truss-weld construction, 100 feet long by 30-foot beam by 8 feet deep, and will be of the raked type, with 10 feet rake forward and 5 feet rake aft. The hulls will have 12 inches sheer forward and 6 inches sheer aft; the decks will be given a 6-inch crown and the bottoms a 6-inch deadrise. Each hull is to have six tank compartments and two peak compartments, divided by one centerline and four athwartship bulkheads.

Work Contemplated

George G. Sharp, naval architect, 30 Church street, New York, expects soon to issue plans and specifications for reconditioning and alterations on several vessels of Moore & McCormack's American Scantic line, New York. Passenger accommodations will be added to each vessel.

Superintendent of lighthouses, New Orleans, received bids March 26 for two direct reversible diesel engines complete with two electric generating sets, compressors, etc., for the tender CAMELIA.

The Savannah line CITY OF MONTGOMERY, damaged by fire at sea and which reached port in New York on March 7 with fire still burning in the hold, was to be drydocked for survey, after which plans and specifications for repairs were to be issued by Frank S. Martin & Son, 25 Broadway, New York.

The Acheson Oildag Co., Port Huron, Mich., has published a technical bulletin on the use of colloidal graphited lubricants in "running-in" operations.

Twelve Summer Cruises are Scheduled by Cunard

The Cunard line has arranged a schedule that will call for twelve summer cruises, beginning later in June and closing in September.

The CARINTHIA will inaugurate the season by sailing on June 26 on a North Cape-Russia cruise under the auspices of Raymond-Whitcomb, lasting 49 days and calling at ports in Iceland, Norway, Denmark, Danzig, Poland, Sweden, Russia, Finland, Germany, England and France. From July 5 to July 9 the steamer will be in the "Land of the Midnight Sun," there being no sunset during these days.

The BERENGARIA, the 52,000-ton giant, will make two cruises. The first over Independence day week-end, will be to Bermuda. This will be more than a week-end cruise, as the steamer will remain in Bermuda for two days. The second BERENGARIA cruise will be to Nova Scotia over the Labor day week-end.

The MAURETANIA will make five 12-day sea-breeze vacation cruises to the West Indies and South America. The ship will call at Port of Spain, Trinidad; La Guaira, Venezuela; Willmested, Curacao; Colon, Panama, and Havana, Cuba. The dates of sailing from New York are July 7, July 21, August 4, August 21 and September 8. The steamer will remain in white paint which will keep her cool and comfortable in tropical waters.

The FRANCONIA will make three triangular cruises, calling at ports in Canada and then sailing southward to Bermuda. These will also be 12-day vacation cruises. Like the MAURETANIA, the ship will sail Saturday evening and return a week from the following Friday. The FRANCONIA will call at Boston. Reaching the St. Lawrence she will steam down that stream to the Saguenay river, making a tour up that river to the Canadian capes. She will also make calls at Quebec, and Corner Brook, Bay of Isles, N. F. Leaving this port she will spend two days in Bermuda, and then return to New York. The FRANCONIA's sailing dates will be July 28, August 11 and August 25.

Leaving New York on September 18 the FRANCONIA will make an extensive cruise to the West Indies, Brazil and Argentina. This will be the principal ship to carry pilgrims to the Eucharistic congress to be held this year in Buenos Aires. The FRANCONIA will make calls at Havana, Trinidad and Rio de Janeiro on her way to Buenos Aires. She will make return calls at all of these ports. The ship will spend five days and four nights in Buenos Aires. On this sailing Thos. Cook & Son and the American Express Co. will act in co-operation with the Cunard line.

Personal Sketches of Marine Men

Daulton Mann, Executive Vice President, Grace Line

By Ben K. Price

AS EXECUTIVE vice president of the Grace Line, he is in charge of the operation of six distinct passenger and freight services.

THOUGH one of the youngest American merchant marine executives, his experience in shipping covers a period of over 20 years.

HE ADVOCATES American labor on American ships and has placed approximately 100 per cent American crews on Grace line vessels.



TWENTY-TWO years or so ago, a young fellow, still in his teens, was grinding away at a dock clerk's job down in Panama; today, at the age of 41 he is a leading executive in the American merchant marine, one of the youngest of his class, a ship operating man known from coast to coast and a strong advocate of the principle of American labor for American shipping. His name is Daulton Mann.

As executive vice president of the Grace Line, New York, a position which speaks for itself, he has come up the ladder, faster than most, by sheer dint of ability and enterprise, with an understanding of operating problems obtained first hand and based on exceptionally well-rounded practical experience.

Born in 1893, in Oakland, Calif., he received his early education in San Francisco, and before he was 20 had entered the employ of the California-Atlantic Steamship Co. as a shipping clerk in Panama. In this affiliation he was perhaps especially fortunate, for trans-isthmian traffic in the days before the canal was completed provided him with a variety of instruction, even though he spent but a year on this job.

Upon the suspension of the California-Atlantic Steamship Co., activities he returned to San Francisco and began his long years of service with the Grace organization. His first important post came two or three years later, when, in 1917, W. R. Grace acquired first an interest and then possession of the old Pacific Mail Co. Still in his early twenties but already a veteran in experience, he was appointed assistant general manager, and, seven years later, when the Grace company reorganized this enterprise to administer it as the Panama Mail line, he became general manager and vice president.

Then five years later—on Nov. 19, 1930, to be exact—he became executive vice president of the Grace Line,

with headquarters in New York, although retaining his duties as vice president of the Panama Mail line. This step came as a logical development in a career devoted to ocean transportation and to constant study of its problems, and placed him in charge of the operation of six distinct passenger and freight services, linking Atlantic, Gulf and Pacific ports of this country with those on the west coast of central and South America, an operation which today means the direction of approximately 30 vessels, including the four new deluxe liners, SANTA ROSA, SANTA PAULA, SANTA LUCIA and SANTA ELENA, built at a cost of approximately \$20,000,000.

These new liners, in the planning of which Mr. Mann took an active part, are probably the finest of their class afloat under any flag and have proved very popular with travelers. They are the first American ships having all outside rooms with private baths. Public rooms have been brought "up top" where there is ample light and air; decks made wide and with as few obstructions as possible; colors and materials used to give an atmosphere of coolness and comfort in tropical waters.

As one who has come up from the bottom to his present position as operating head, Mr. Mann knows the problems of his men and has been particularly active in their welfare. As a strong advocate of manning American ships with American labor, he has been instrumental in placing approximately 100 per cent American crews on Grace ships, thus far exceeding the demands of the La Follete act which requires that 66½ per cent of the labor on American ships be of American origin.

He resides on Manhattan and is a member of various marine and social organizations. He still retains membership in two or three leading clubs in San Francisco and, in New York, is a member of the Racquet and Propeller clubs, and the India House.

Furness-Bermuda Sailings Booked to Capacity

Bermuda, which has continued to enjoy an unprecedented popularity during the past several years, will receive a record number of visitors during the Easter holiday season, and so great has been the demands for accommodations on the MONARCH OF BERMUDA and the QUEEN OF BERMUDA, of the Furness-Bermuda line that the company, which booked the amazingly high total of 4574 passengers on nine sailings between the period of March 17 to March 31, has been forced to hang out "sold out" signs on the remaining voyages. Hundreds of disappointed persons have been turned away and the company has even been forced to route its South American motorliner EASTERN PRINCE via Bermuda in order to accommodate a number of its patrons.

Capt. Charles M. Armstrong, passenger traffic manager of the Furness lines said that each sailing is establishing new all time records for the Bermuda trade and he is confident that he could easily fill another vessel of the MONARCH OF BERMUDA's type if one was available.

The Furness-Bermuda line's new ships, the QUEEN OF BERMUDA and the MONARCH OF BERMUDA, as well as the number of new palatial hotels which have been built in the past few years have greatly contributed to the steady increase in travel to Bermuda.

The Easter holiday exodus to Bermuda got under way on March 17 when the MONARCH OF BERMUDA sailed with 747 passengers. She was followed March 21 by the QUEEN OF BERMUDA with 725 passengers. On March 24 the MONARCH OF BERMUDA sailed with 827 passengers and the EASTERN PRINCE sailed the same day with at least 75 passengers destined for Bermuda. The QUEEN OF BERMUDA sailed again on March 27 with 700 passengers and was followed the next day by the MONARCH OF BERMUDA with 750 passengers. Saturday, March 31 marked the final scheduled Easter sailing with the QUEEN OF BERMUDA leaving New York with 750 passengers.

The peak northbound sailings from Bermuda will be on April 6 when both the QUEEN and MONARCH OF BERMUDA will leave the dock at Hamilton booked to capacity and will reach New York on the morning of Sunday, April 8.

Short Cruises Planned

The success of the Canadian Pacific Steamship Line's summer cruises from New York to Quebec and Montreal during the past two years, when a total of 14,843 passengers sailed on the Duchess of Athol and Duchess of Bedford, has prompted the company to repeat these short holiday voyages in the coming sea-

son. The Duchess of Richmond, a sister ship of the two mentioned above, is to be used and will make her first appearance in New York harbor on July 25.

Three nine-day cruises from New York to Quebec and Montreal and return are scheduled, sailing at midnight July 25, Aug. 4, Aug. 14, and Aug. 24, the last sailing being to Montreal only. Rates will range from \$100 top price to \$65 minimum for a round trip. All passengers will be permitted use of the entire ship regardless of fare paid. Autos will be carried for \$30 each way.

Combined Ship and Rail Tours Arranged

Arrangements were recently completed between the Pennsylvania railroad and the Grace line whereby travelers during the coming season can see their own country and at the same time visit our sister republics at comparatively small cost.

The traveler is carried by rail to New York, thence by steamer through the Panama canal, via the Spanish Americas, to San Francisco or Los Angeles and return by rail to his starting point. This permits of visits on the water trip to Havana, Colombia, South America, the Panama canal, El Salvador and Guatemala in Central America, and Mexico. On the transcontinental trip the Zion, Estes, Grand Canyon, Glacier, Yosemite and Yellowstone Parks and the famous Carlsbad Caverns of New Mexico are among the objectives which may be seen. The trip may also be made in the reverse direction by rail to California, steamer to New York and rail to starting point.

All the prospective traveler is required to do is see his local railroad ticket agent.

Jones & Laughlin Steel Corp., Pittsburgh, has been awarded contract by the United States engineer office, Vicksburg, Miss., on its bid of \$51,216, for the construction of two mooring barges. Bids were received Feb. 15; delivery to be made within 110 days.

Shipping Subsidy Program

(Continued from Page 10)

Competitive Bidding

THE department of commerce shall announce vessel and service requirements for routes to be subsidized and awards will be made on the basis of competitive bidding. Response will be compared with data prepared in the department in order to determine the reasonableness of bids. Provision should be made which will permit the waiving of public bidding in the event only one qualified company is competent to bid on a particular service."

Big Gain in Passengers at San Francisco

Optimistic statements made by San Francisco shipping men at the beginning of 1934 may have been taken with a grain of salt at the time, but the figures are more than bearing out those encouraging predictions.

On March 15, the General Steamship Corp. Ltd., which handles passenger bookings for "700 ports on all the seven seas," reported its February business up 120 per cent over the same month of 1933.

R. V. Winquist, manager of the General Steamship's passenger department, credits the phenomenal increase in travel business to a combination of improved business conditions, the elimination of fear of the future, and greatly reduced travel costs.

In regard to the latter, Mr. Winquist says the expense of travel has declined during the past two years to a greater extent than the value of the dollar in foreign exchange. Many European countries have reduced hotel and train fares to offset the falling off of the dollar. For example, prior to the War—back in the "good old days"—the rail fare from Naples to Switzerland was \$16.70. Today, with far better rail accommodations, the fare is only \$11.60.

Los Angeles Traffic Up

The pick-up in foreign trade at Los Angeles is very marked when both imports and exports for February are compared with those of February, 1933. Exports in February of this year amounted to 329,229 tons, with a value of \$5,412,047, while in February, 1933 exports totaled 263,890 tons; \$3,880,182 value. The increase therefore was nearly 40 per cent in value. Imports in the month just closed amounted to 32,998 tons, valued at \$3,576,152, as against 32,689 tons of \$1,590,076 value in February, 1933. While this was a very small gain in volume it was an increase of 125 per cent in value, the large valuation gain due to large shipments of silk from Japan.

Foreign Trade Increase

Total foreign trade, both in and out, for the month, therefore, amounted to a little less than \$9,000,000, compared with \$8,327,583 in the previous month of January.

Shipments to Hawaii also showed a considerable gain over February a year ago, and also over January of this year.

Lumber receipts for February averaged slightly over 1,000,000 board feet per day, 28,310,000 total for February, against 18,545,000 in February, 1933. Oil shipments were 6,149,503 barrels against a total of 5,430,687 barrels in February, 1933.

Marine Review

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*The National Publication Covering the Business of
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Ferry Steamer—Del-Mar-Va

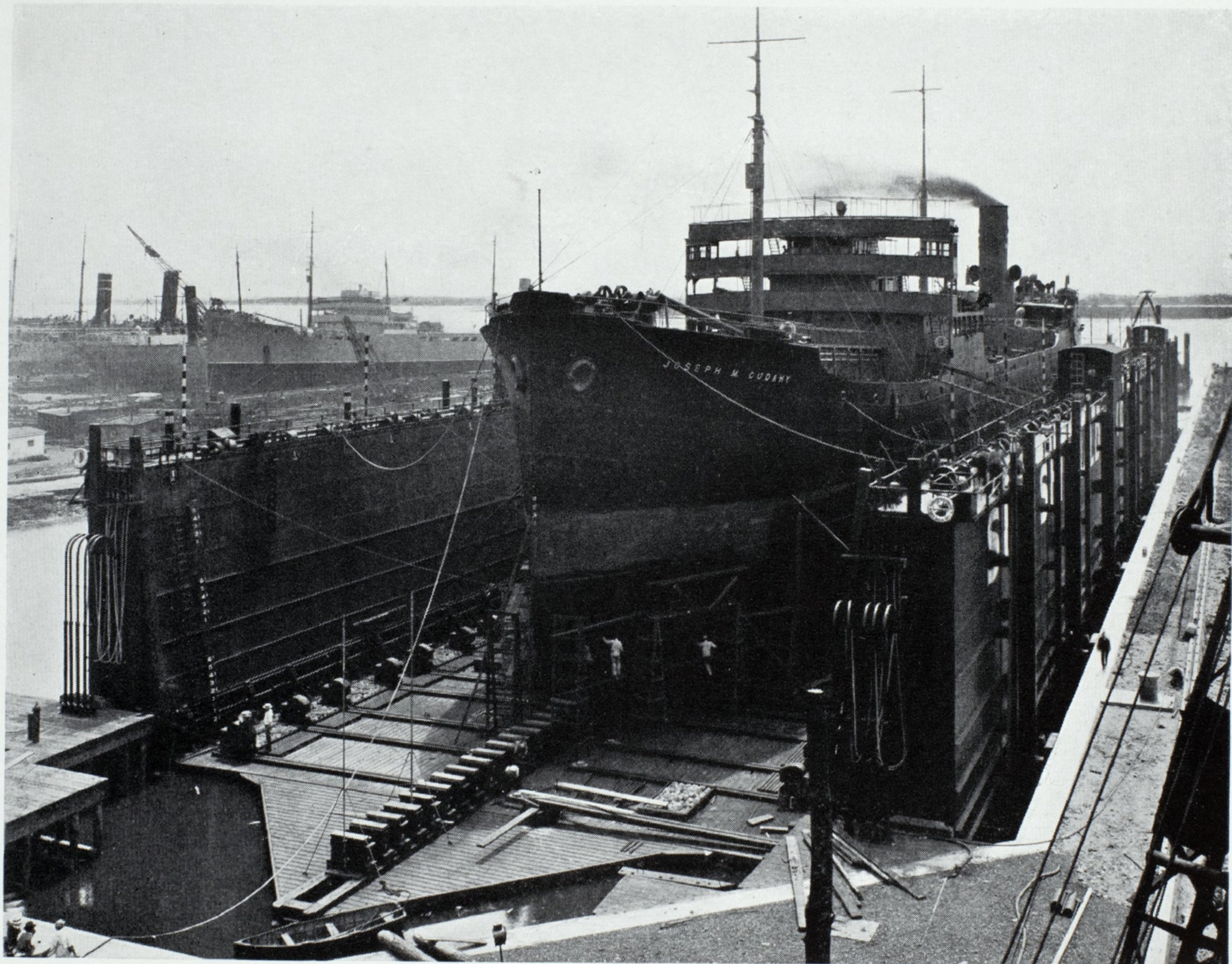
April, 1934

MARINE REPAIRS

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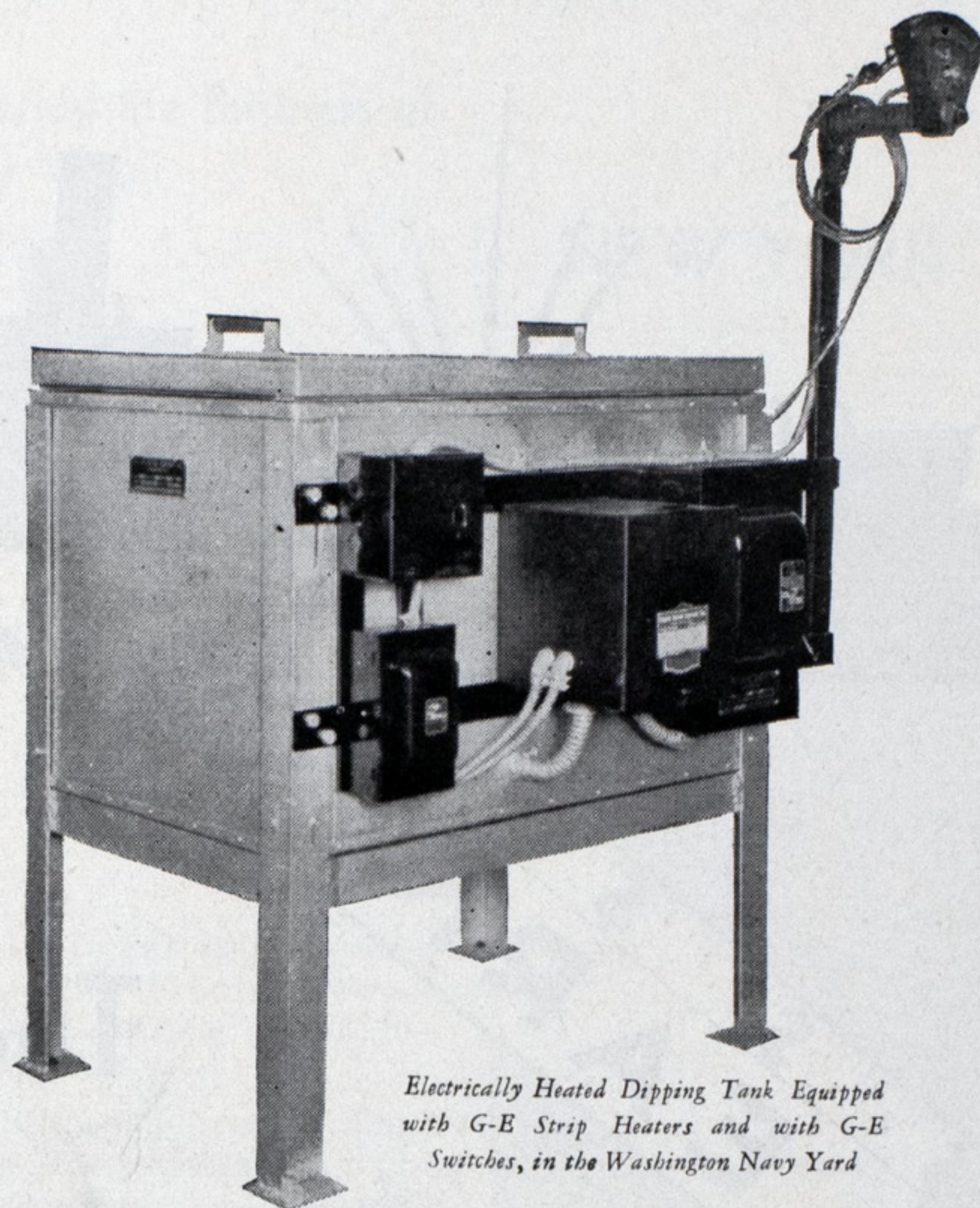
HOW to Profit with Electric Heat in Shipyards

GLUE-heating equipment, armature-baking ovens; heaters to stop the condensation of moisture in the pump room; small-room and crane-cab heaters; heaters to prevent the freezing of valves in the sprinkler system—these are a few examples of how shipyards save money by heating electrically.

Speed, convenience, and accurate temperature control—the particular advantages of electric heat which led to the first shipyard installations more than 15 years ago—are still primary considerations.

Opportunities to use electric heat abound in every shipyard—in the pattern shop, carpenter shop, machine shop, brass foundry, electric shop, and elsewhere. Money-saving uses, too. Have you surveyed your shipyard facilities, with electric heat in mind?

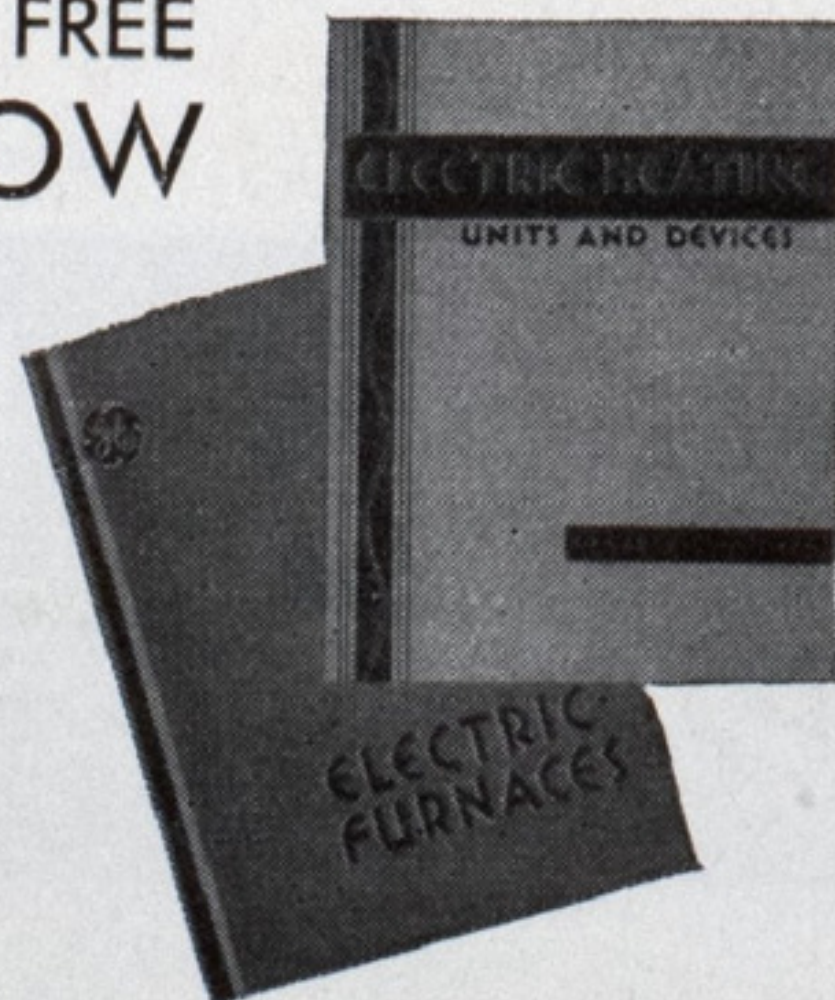
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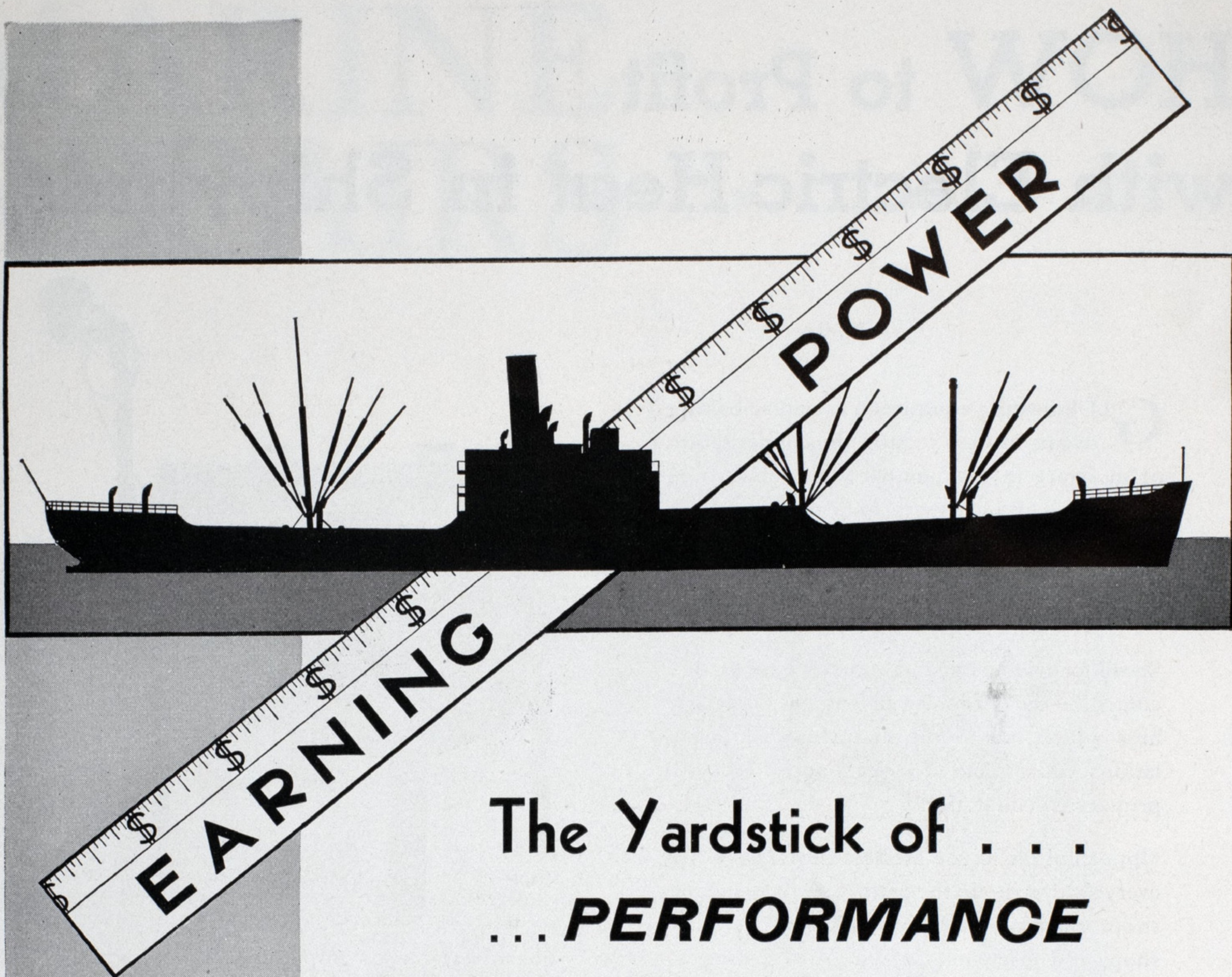
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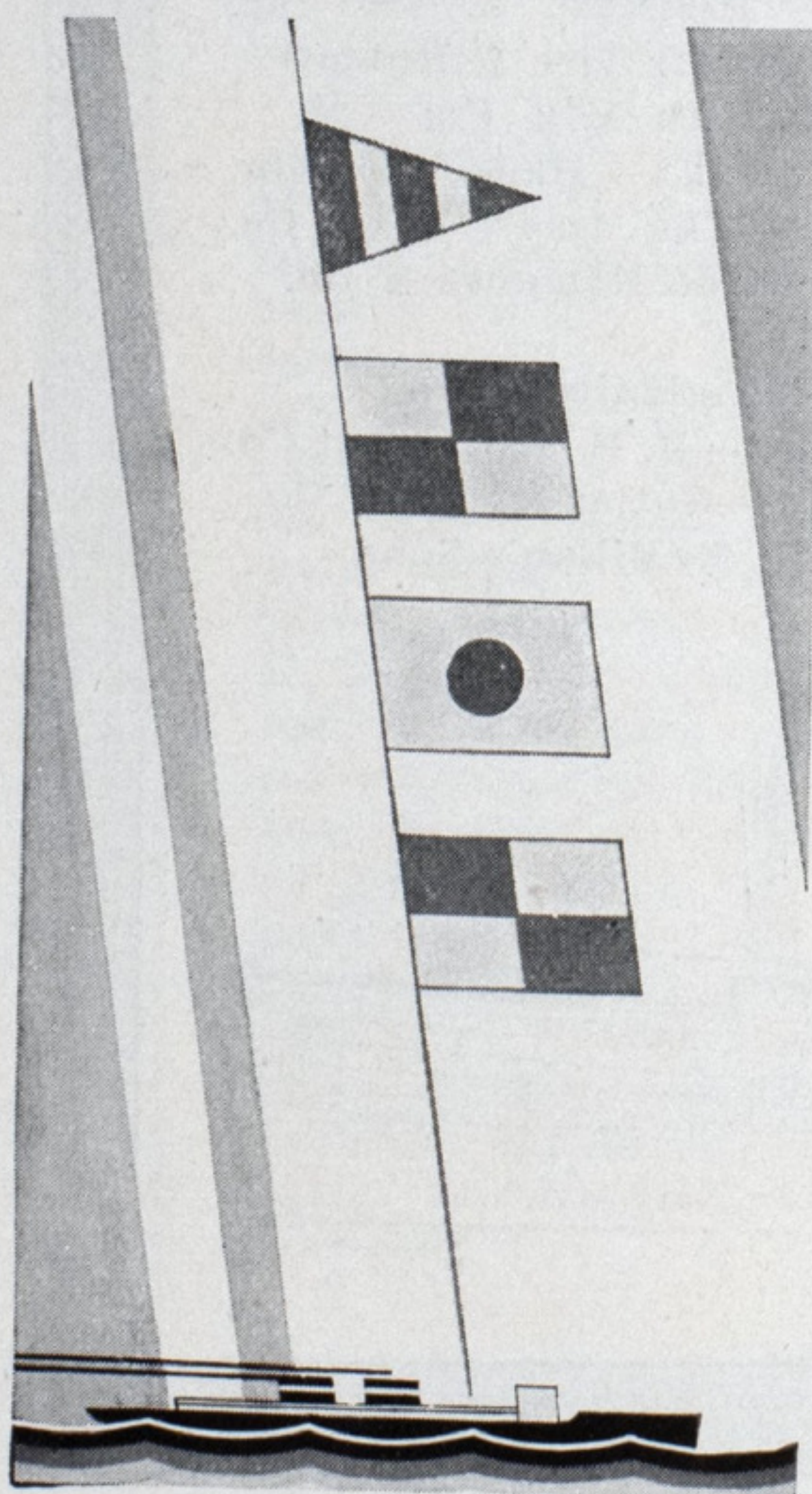
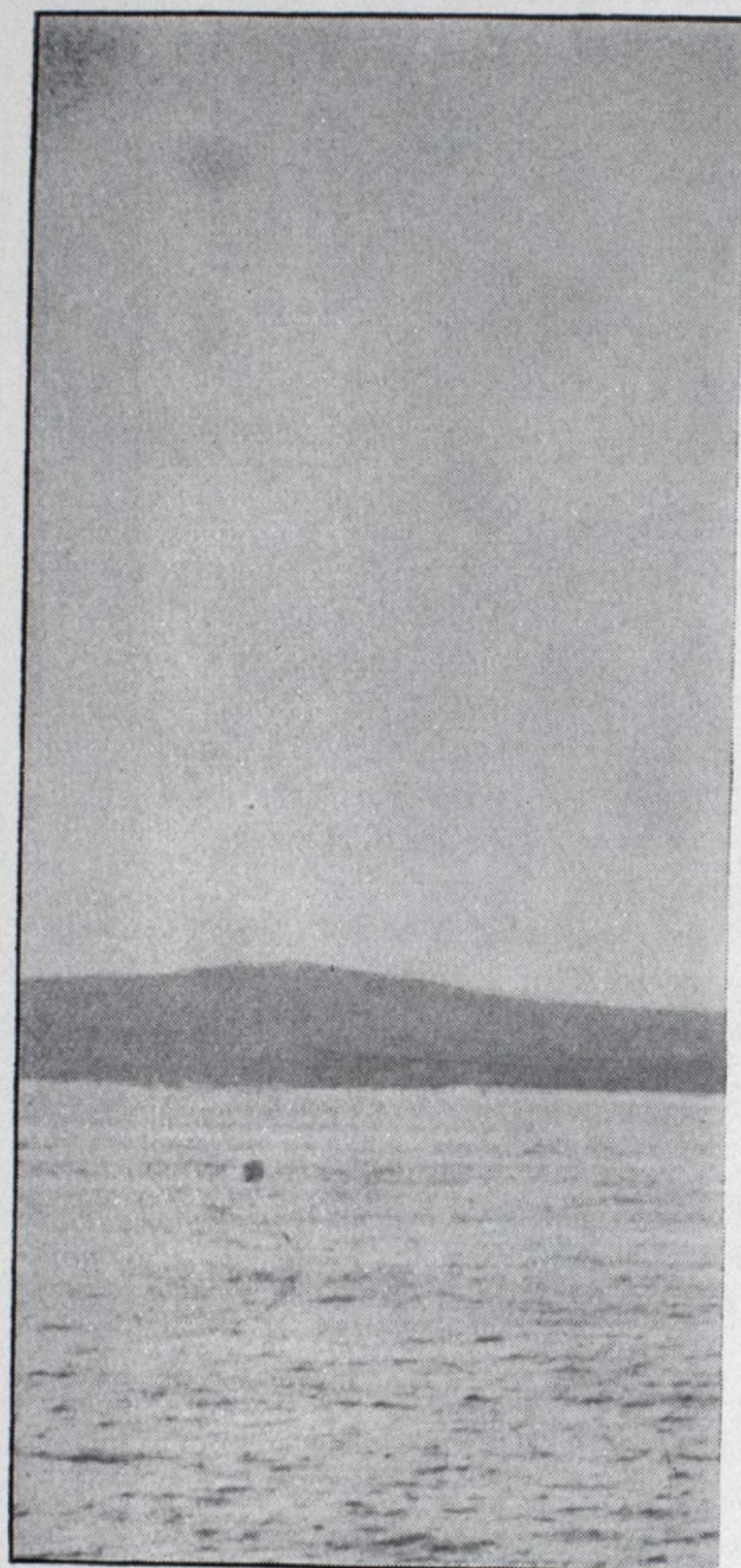
IN Bethlehem's Shipbuilding and Ship-Repair Plants the men who do the work realize that eventually it will be checked by the most searching, most hard-boiled inspector of all—Old Neptune himself. Experience has schooled them in the need for conscientious handling of every detail in preparing the ship for the crucial test . . . The personnel of Bethlehem's shipyards have been up against almost every conceivable problem in ship-repairing. From long experience they know how to do a job in the quickest, best and most economical way. Every part of a repair or overhauling job—whether it's fixing a railing or repairing a stove-in bow, grinding a valve or re-blading a turbine—receives the same painstaking attention, in order that the ship may be a smooth-running, thoroughly seaworthy whole . . . Bethlehem Ship-Repair Plants at Boston, Baltimore, San Francisco and San Pedro are prepared to handle your job right at a fair price.



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Where WESTINGHOUSE on the S.S.



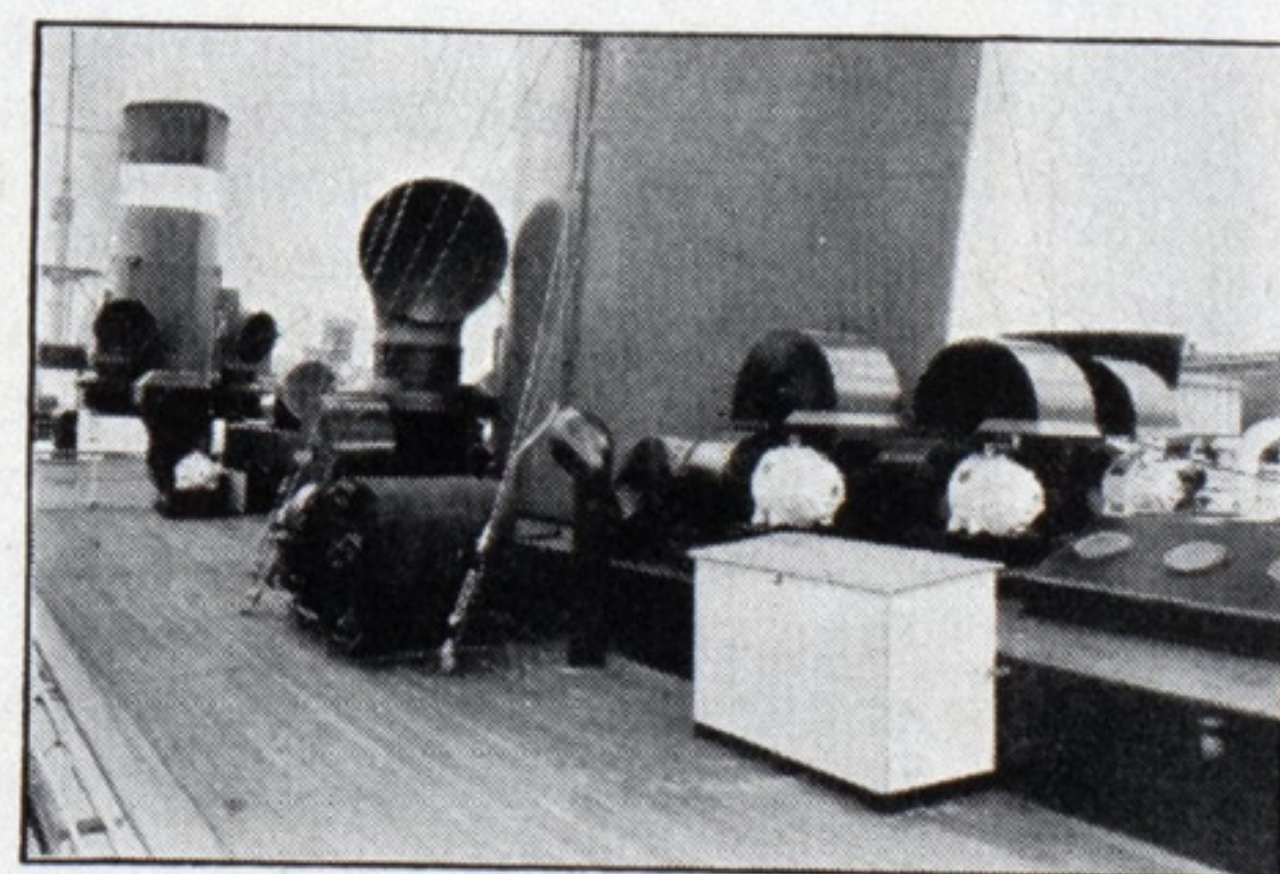
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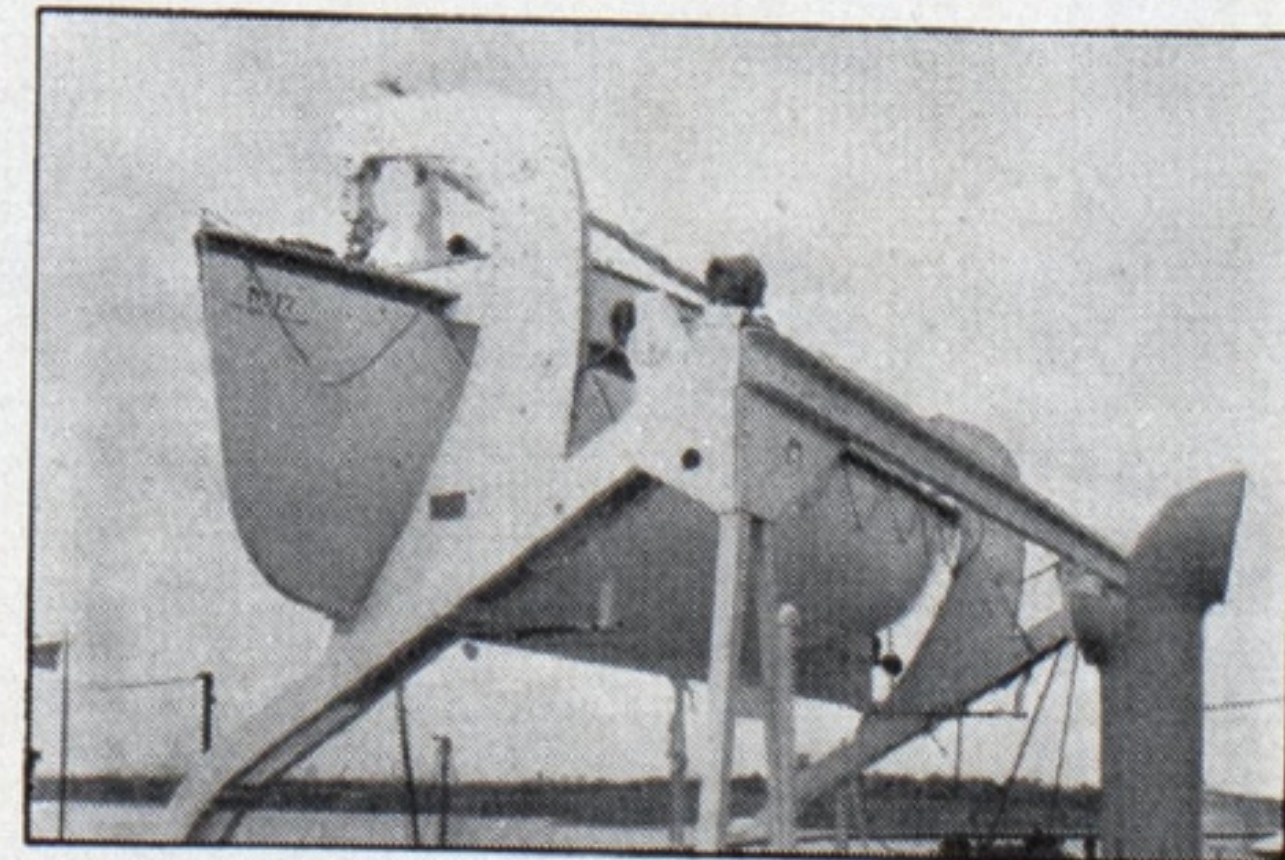
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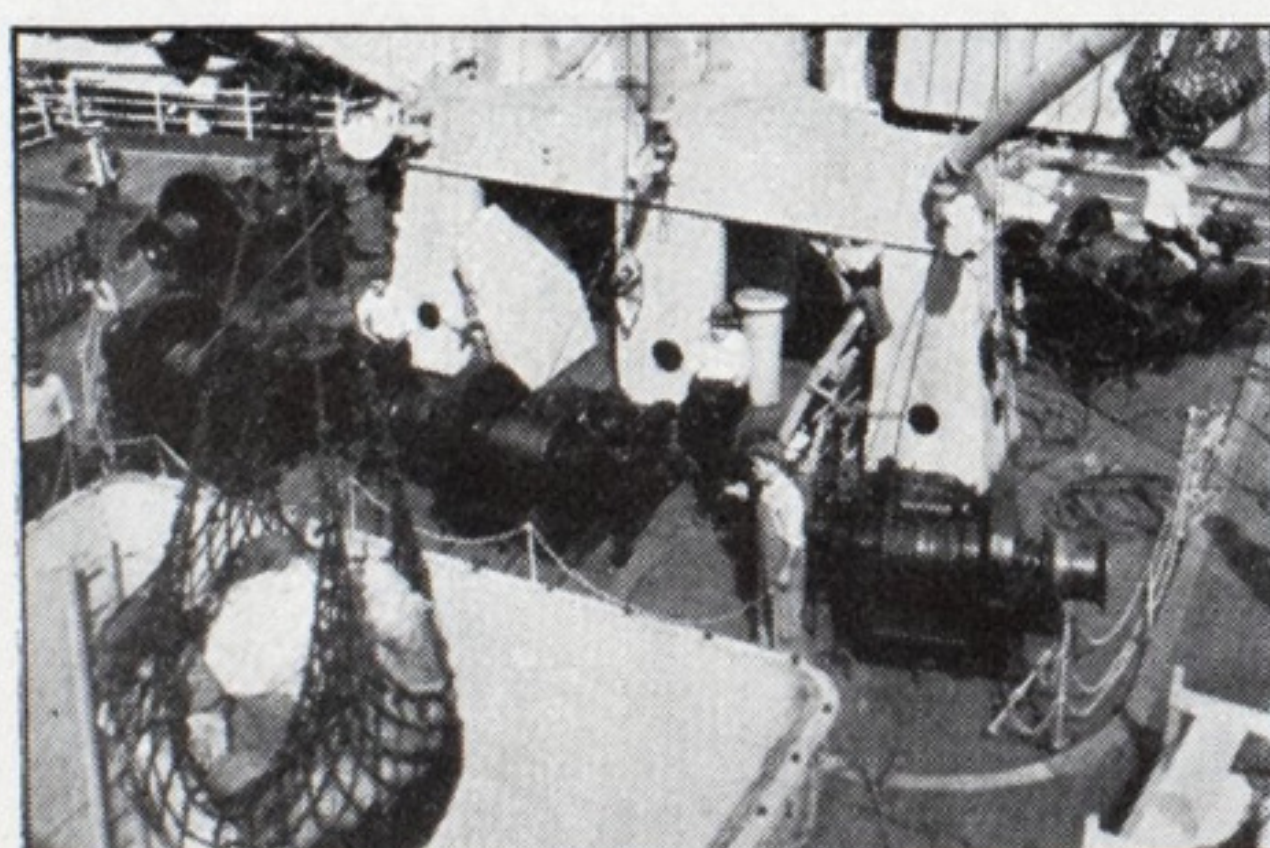
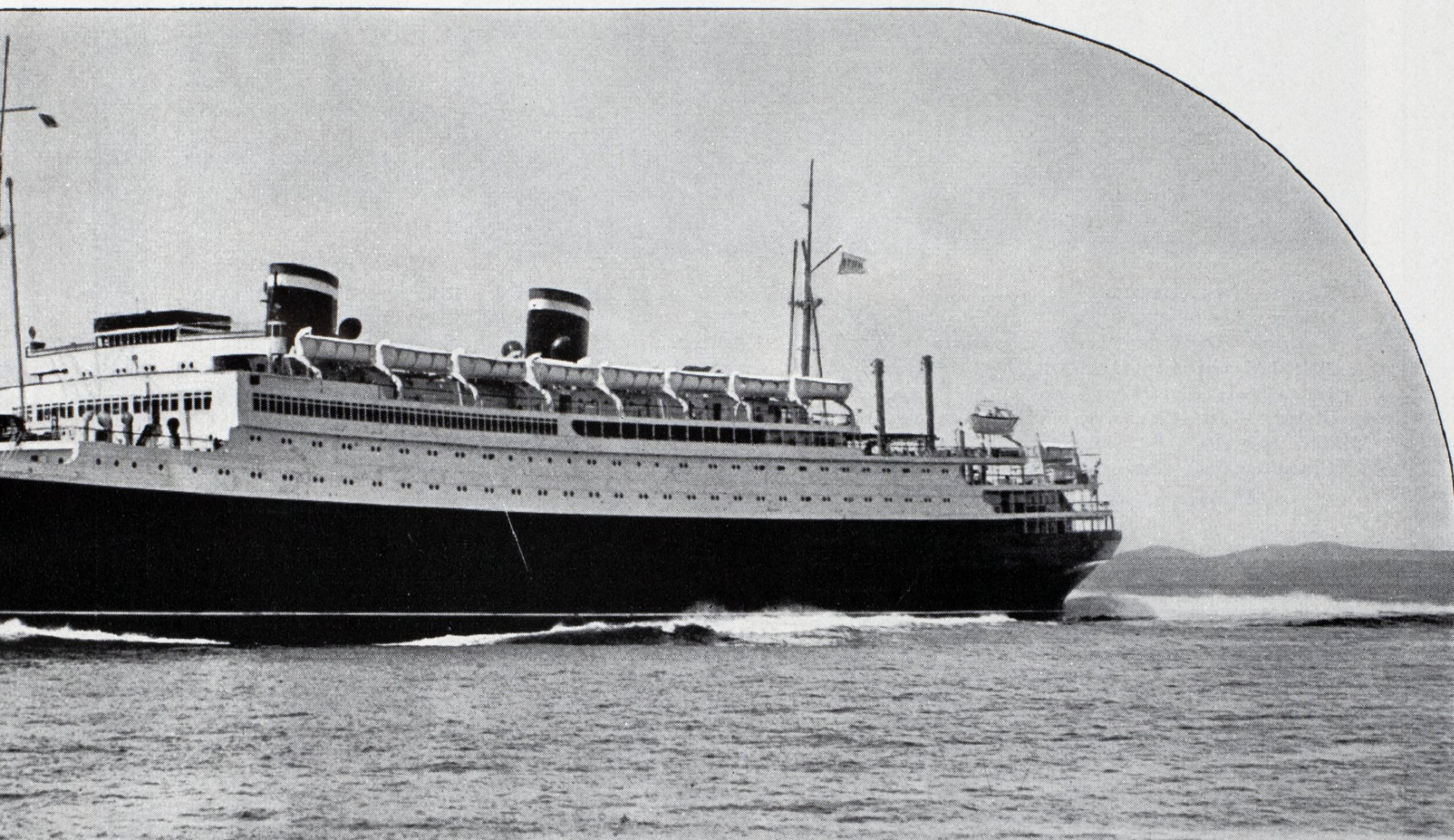


The main ventilating system is operated by Westinghouse Motors.

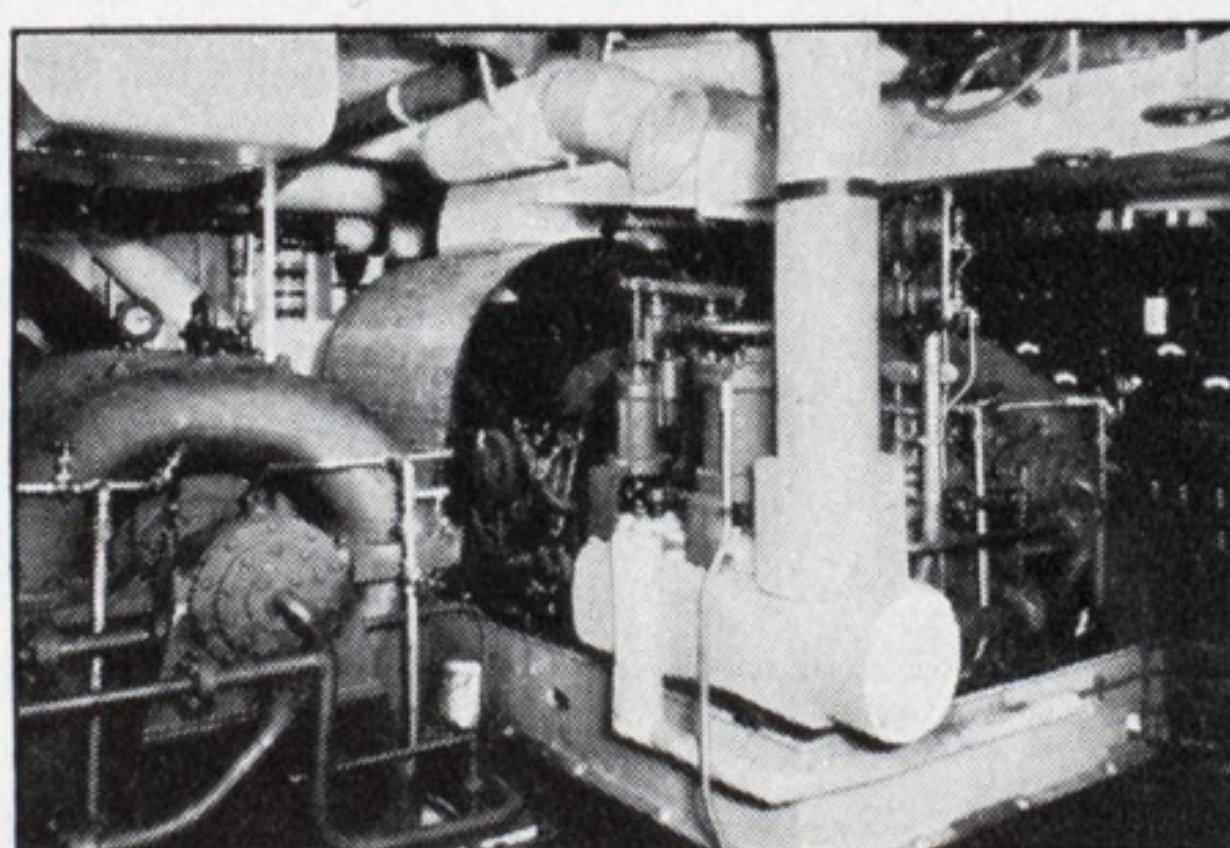


Westinghouse Motors operate the life-boat davits.

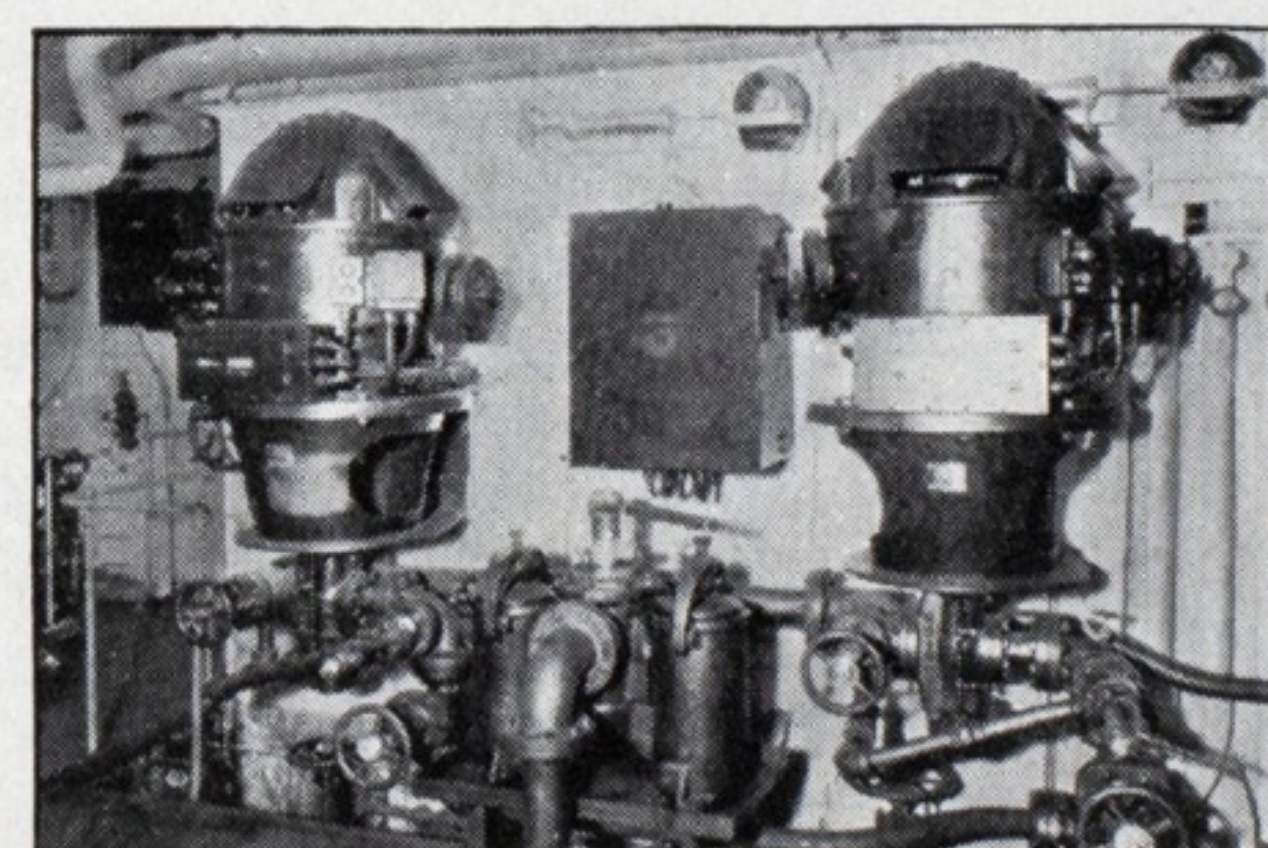
takes over the watch **WASHINGTON...**



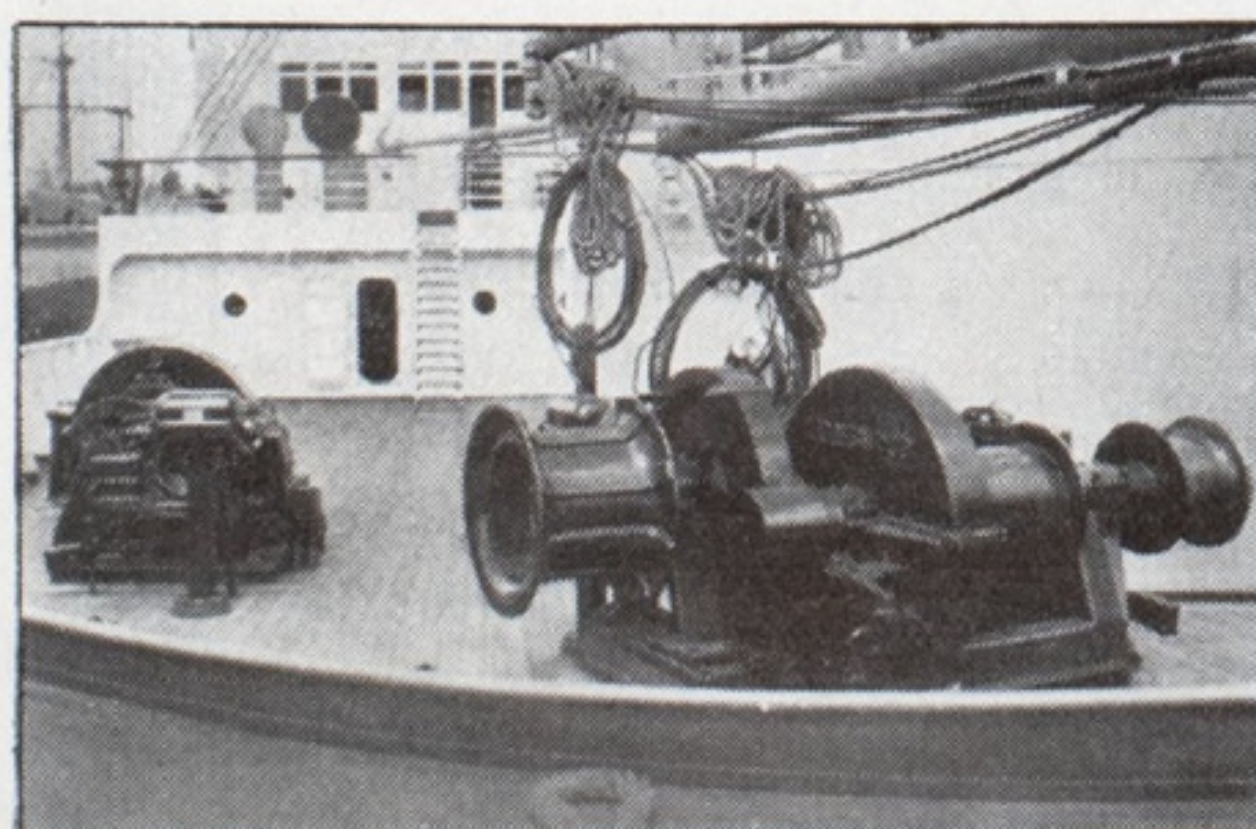
Lowering the cargo net with hi-speed winches, driven by Westinghouse Motors.



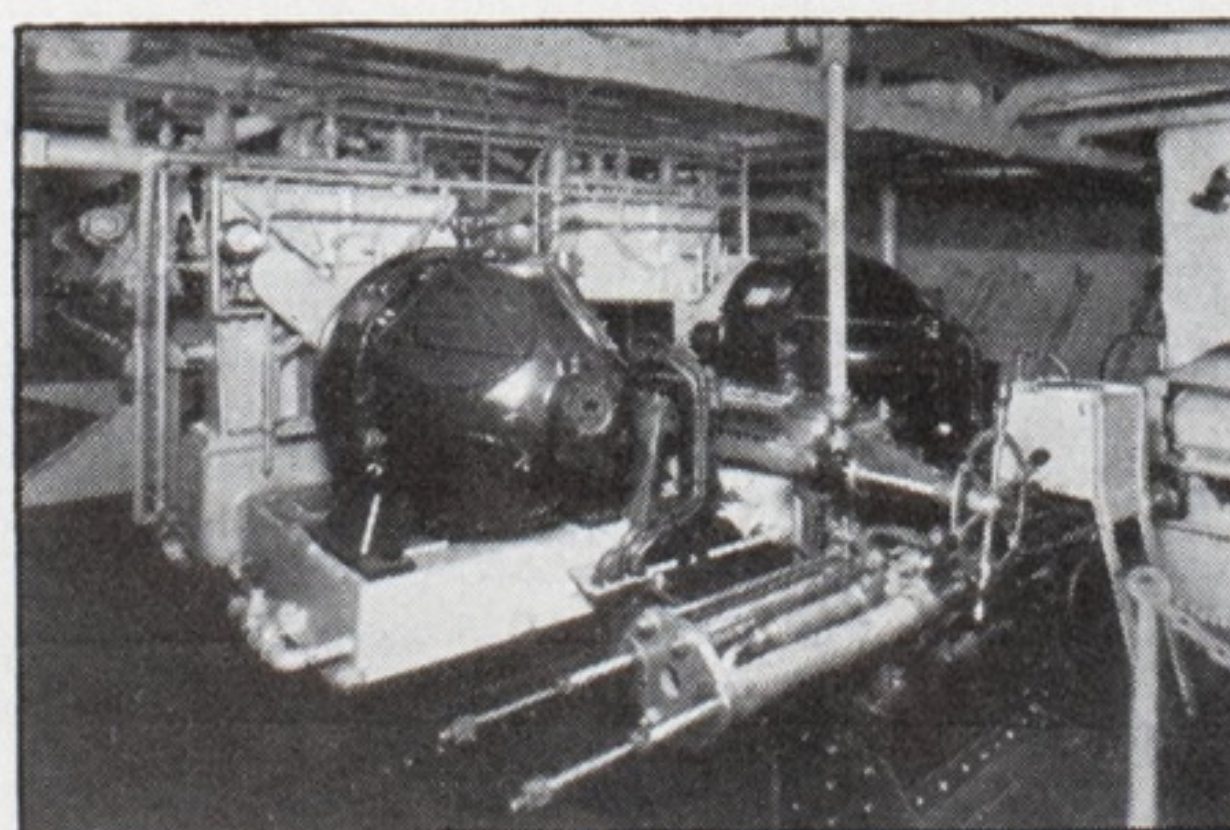
Westinghouse 500-kw. Turbine Generators for auxiliary power and light.



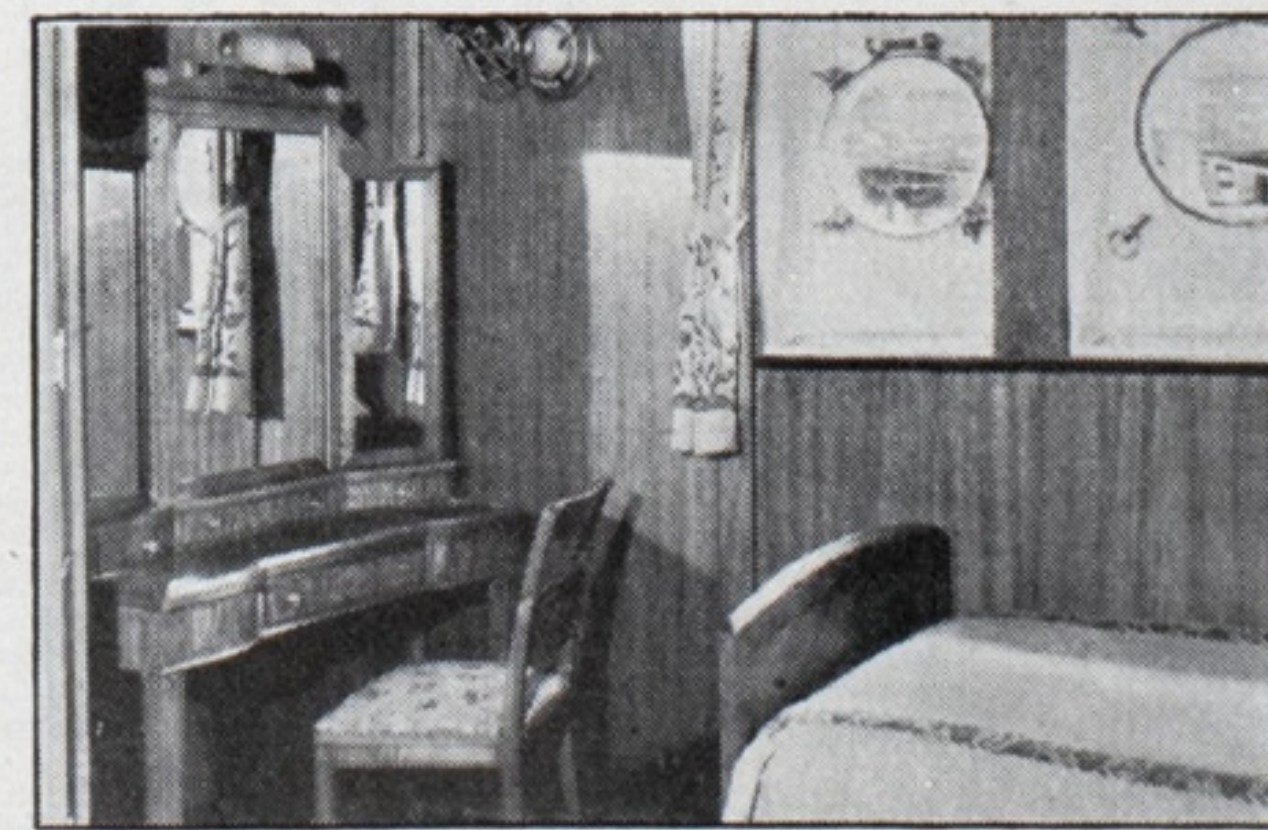
Westinghouse Motors in the black gang driving fuel pumps.



Hi-speed Westinghouse Motors and Control drive the warping winches.

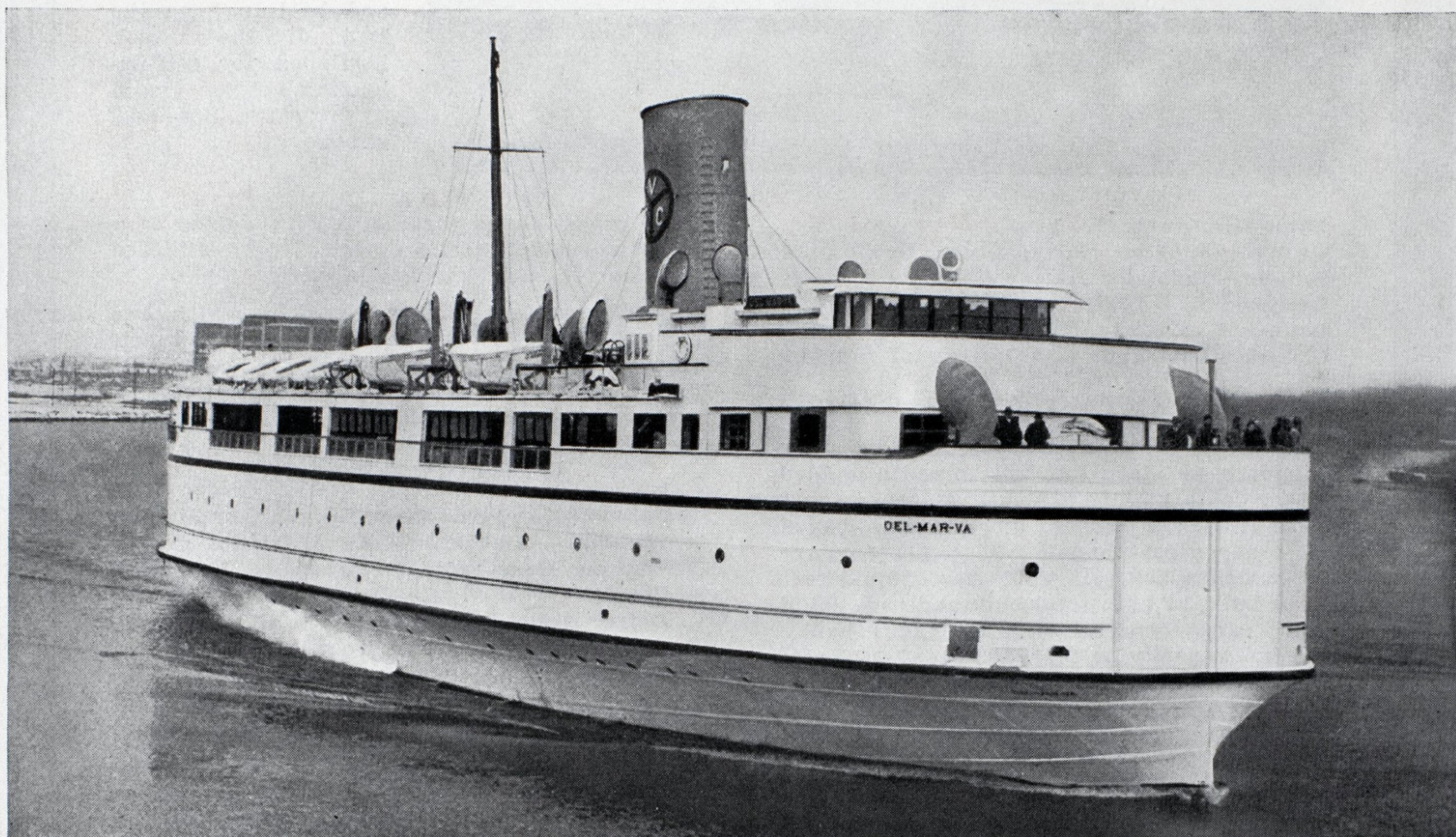


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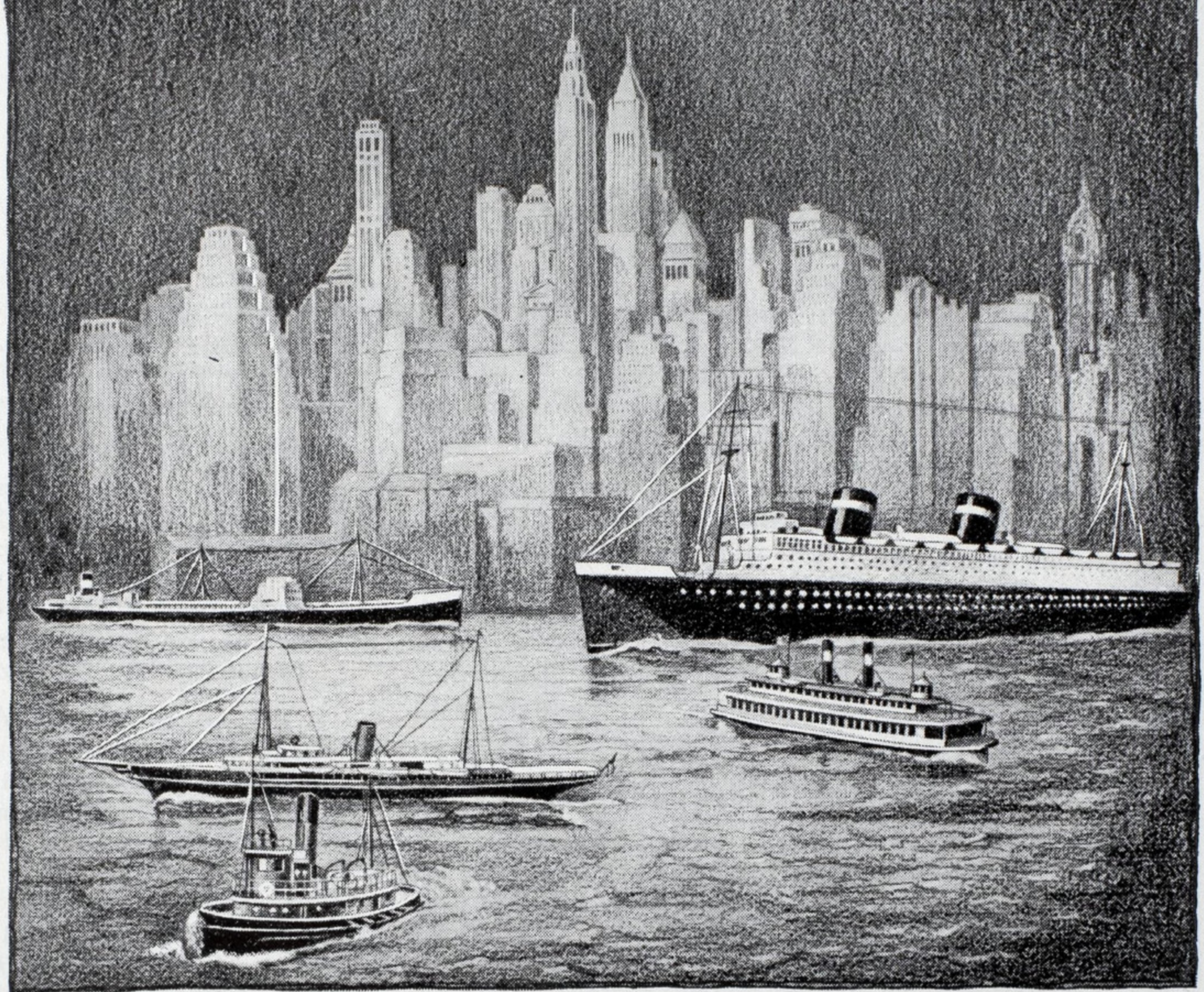
TWICE within a year, the Winton-Diesel-powered tug *Turecamo Girls* has commanded the attention of New York shipping men. The first time was her initial appearance when she was exhibited to the public at Battery Park as if she were a palatial new passenger liner about to enter service. The second time was when the *Turecamo Girls* consistently, during the past winter, out-performed other tugs in ice-blocked harbors and bays. It was this remarkable performance under adverse weather conditions which was responsible for word spreading around New York that at least one tug was available which would reach her destination and deliver her tow no matter where that destination might be. With almost every line of freight movement crippled by heavy snowfall, with waterways frozen and a totally unprepared suburban populace facing sub-zero weather, many unusual demands were made upon this Winton-powered vessel in recent weeks. The way in which the *Turecamo Girls* met these demands provides a convincing answer to the question—"Why should I power my boat with a Winton-Diesel engine?" Built to the design of Merritt Demarist, of Tottenville, New York, at the Bath Iron Works, for the B. Turecamo Towing Company, of Brooklyn, New York, the tug is powered with a six-cylinder Winton-Diesel, rated 600 b.h.p. at 250 r.p.m. Engine is direct-connected to a 7 ft., 10 in. diameter by 51 in. pitch, 4-bladed bronze propeller.



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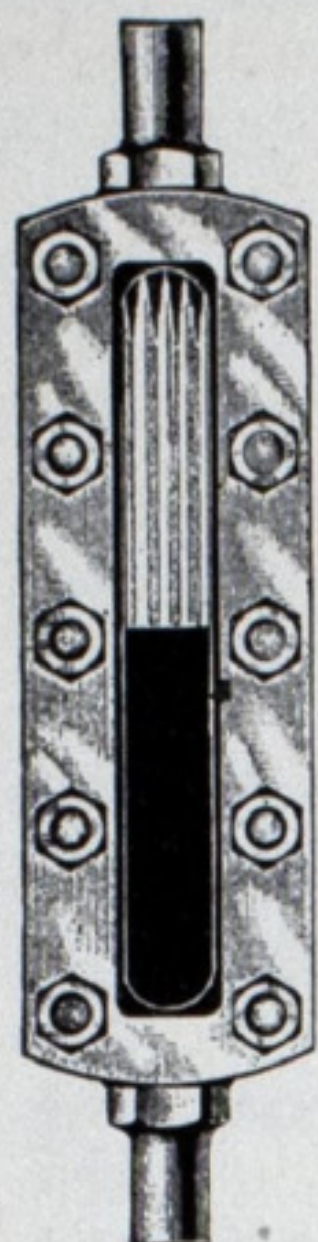
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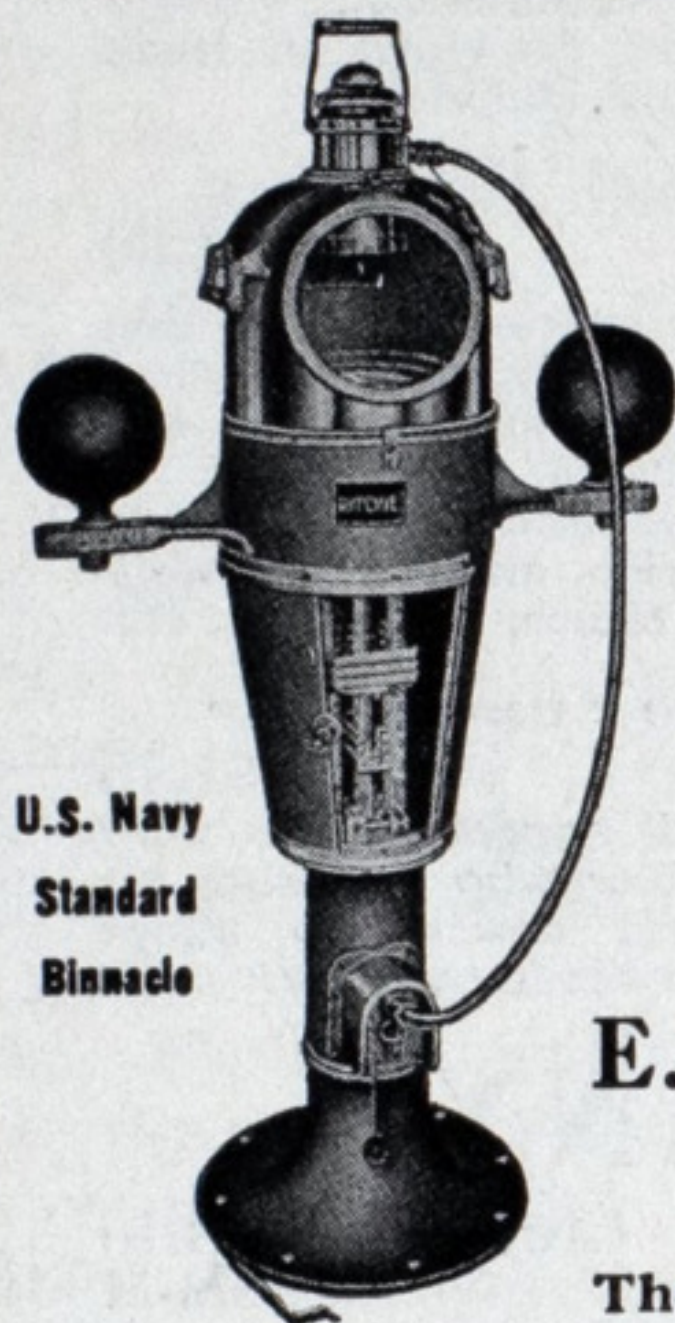
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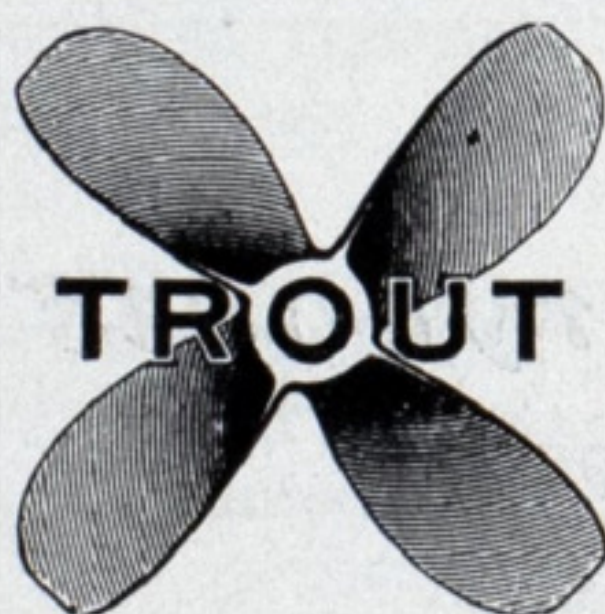
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INDEX TO ADVERTISERS

American Shipbuilding Co.Back Cover

Babcock & Wilcox Co. 29
Bethlehem Shipbuilding Corp., Ltd. 6
Boland & Cornelius 58

General Electric Co. 3

Hamburg-American Lines 57

Jerguson Gage & Valve Co. 58
Jones, R. T., Lumber Co. 58

Newport News Shipbuilding and Drydock Co..... 4

Pusey & Jones Corp. 21

Reading, E. H. 58
Ritchie, E. S., & Sons 58
Riverside & Fort Lee Ferry Co. 57

Sun Shipbuilding & Dry Dock Co.....
.....Inside Front Cover

Westinghouse Electric Co.16, 17
Westinghouse Traction Brake Co. 33
Winton Engine Corp. 25

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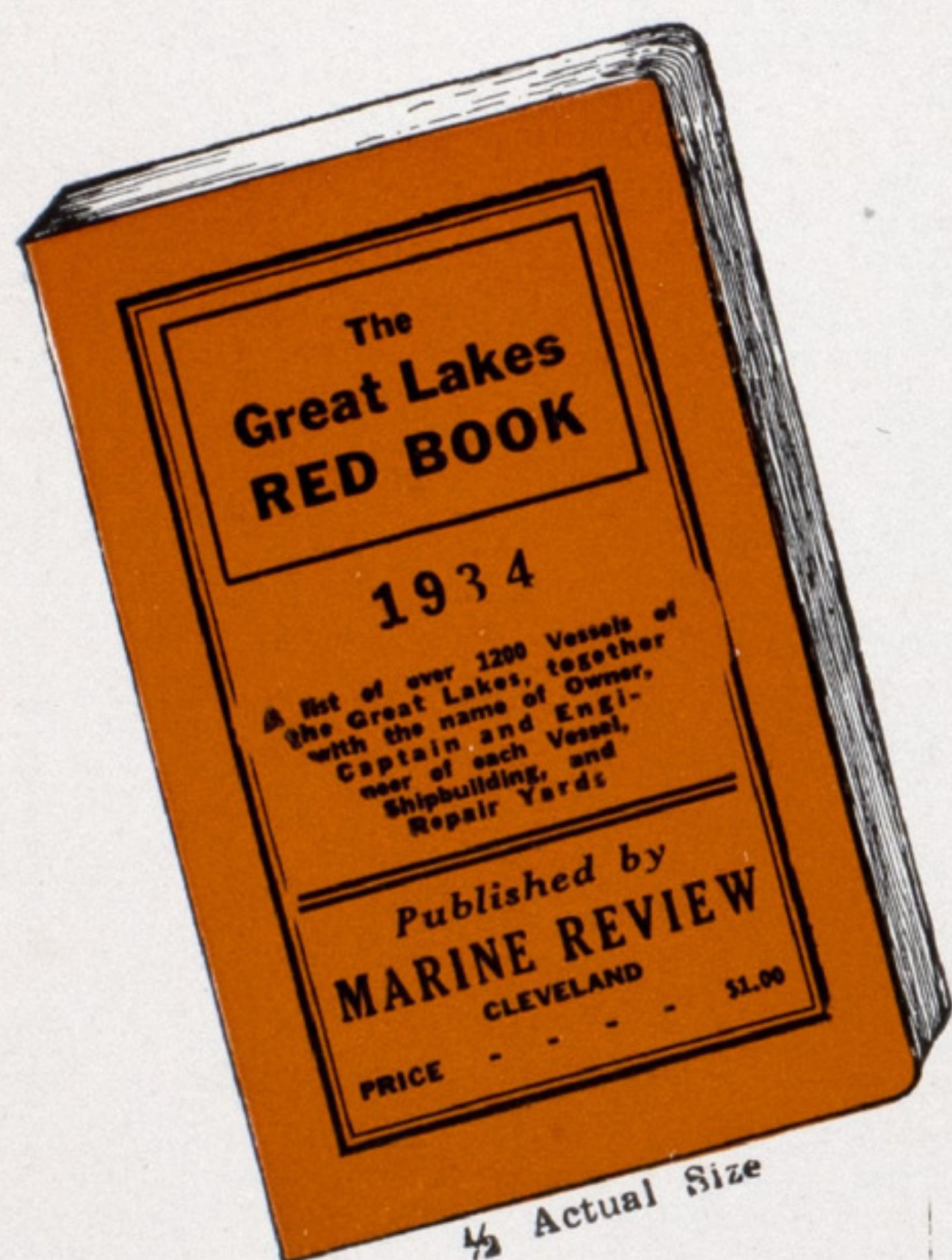
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